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DOCUMENTS

SUBMITTED BY THE

BUREAU OF AGRICULTURE

TO THE

LEGISLATURE OF CANADA.

Printed by Order of the Legislative Assembly.



QUEBEC:
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1855.

DOCUMENTS

Submitted by the Bureau of Agriculture to the Legislature of Canada.

1.—Honble. Malcolm Cameron's Report.
2.—Mr. Alexander Kirkwood's Report on Flax.
3.—Mr. William McDougall's Report on American Agricultural Implements, Seeds, &c.
*4.—Mr. Rheaume's Report on the Agricultural state of the District of Quebec.
5.—Report from the Upper Canada Board of Agriculture.
6.—Report from the Lower Canada Board of Agriculture.
7.—Report from William Antrobus Holwell, Esquire, on the New York Industrial Exhibition and Canadian contributions thereto.
*8.—Mr. Wm. Hutton's Report on Agriculture.
9.—Abstracts of Letters Patent of Inventions from 1824 to 1854. (September.)

Bureau of Agriculture, Quebec, 1854.

*[*Note.—Ordered, by the Committee on Printing, not to be Printed.*]

HON. MR. CAMERON'S REPORT.

To His Excellency the Right Honorable James Earl of Elgin *and* Kincardine, *K.T., Baron Bruce, of Kinross and of Torry, one of Her Majesty's Most Honorable Privy Council, Governor General of British North America, and Captain General and Governor-in-Chief in and over the Provinces of Canada, Nova Scotia, New Brunswick, and the Island of Prince Edward, and Vice-Admiral of the same.*

Quebec, 20th August, 1854.

May it please Your Excellency:

Having had the honor to be the first to hold the office of Minister of Agriculture, I beg, upon retiring from its duties, to submit to your Excellency's consideration the following report of the steps I have taken since my appointment with the view to advance the interests of that art in the Province, and to suggest certain measures the adoption of which may give more efficient action to the Department, and tend to a harmonious working of the laws now in force regulating Agricultural Boards and Societies.

Before the establishment of the Bureau of Agriculture the Agricultural code consisted of various Acts relating to each section of the Province, which have been amended and consolidated by the 16 Vict., caps. 11 and 18. These Acts provide for the administration of two Boards of Agriculture, and prescribe forms and regulations for Township and County Societies.

The improvement of Agriculture is a subject of national importance, susceptible of aid from wise legislation, and more easily retarded than advanced by indifference or by equal causes. Eminence in the art of husbandry is reached only by intermediate steps, as the place of destination is ultimately arrived at only by successive efforts to move in that direction.

The state of Canadian husbandry may be exposed by referring to some of the items which constitute its annual value. By the Census Returns of 1851, the quantity of wheat produced in Canada is estimated at 16,155,946 bushels, which, at an average price of 5s, per bushel, will amount to £4,038,986. The total of other agricultural productions, with the exception of grass lands, may be given at £3,000,000, whilst the various items constituting the value of these latter may represent an aggregate of £15,000,000.

The principle intended to be deduced from these numbers will be more readily assented to if we suppose that by an improved system of husbandry we could increase the average yield of wheat one bushel per acre. We should thus add to the annual income of the country 1,136,311 bushels of wheat, worth, at an average of 5s. per bushel, £284,078, representing a capital of £4,734,633 gained to the Province by an accession in one article alone of trifling value when viewed as an acreable return.

The Agricultural Returns of the Province which have been before me shew a remarkable deficiency in the article of turnips. There is no vegetable the more extended cultivation of which would be of more essential benefit to Canadian Agriculture. Not to speak of its cleansing effect as a fallow in a well arranged rotation of crops, it may be affirmed, connected with improved pasturage, to be the basis of the increased productiveness of the modern system of husbandry. Its preservation even in our severest winters is a mere matter of arrangement, involving but the construction of a dry root cellar, providing an apparatus for ventilation, and guarding against exposure to extreme cold. I cannot but consider any increased

attention which may be given to this subject as a material aid to the completion of the objects in view by those farmers who have made such efficient and praiseworthy efforts to introduce the most approved breeds of live stock into the Province

As necessary adjuncts to this amelioration in our husbandry I need scarcely allude to subsoil drainage and rotation of crops, subjects which, if understood, receive but little attention in many of our counties.

The large importations of Short-horn Cattle and of Leicester Sheep evince an advanced state of agriculture in the vicinity of their purchasers We do not find these breeds without at the same time seeing an abundance of food upon which they are to subsist. Nor is either to be seen where the farmer does not possess large intelligence and a taste for fine animal forms. The further pursuit of this subject, however would lead to the question of agricultural education which it is not my intention at present to discuss.

I cannot omit to notice the attention which is given in some parts of the Province to the construction of improved agricultural implements adapted to lessen the labourer's toil, as well as to facilitate all farming operations; and more particularly to refer to improvements, as that of the plough clevis, which are original to the country and considered to be worthy of adoption in others.

Our Government, regarding labor as the source of wealth, has adopted a policy in reference to the subject under review as wise as it is enlightened. We now possess a system almost as complete in its naked arrangements, without reference to action in any of its divisions, as the theorist can devise. It is only desirable to discover, if possible, the proper adjustment of the parts to the whole, and the amount of tension each part is capable of sustaining without hazard to the movements of the machine. I allude to the Township and County Societies, the Provincial Associations, the Boards of Agriculture, and the Public Department designated the Bureau of Agriculture, lately established by a Provincial Act of Parliament.

Allowing to each County Society its maximum of the public grant, the sum of £20,000 is annually disbursed for their encouragement. A direct impetus is thus given to emulation, a prize list is offered, and a fair field opened to all competitors. More especially are the good results of this aid to be seen at the annual Provincial Exhibitions, where the best varieties of grain, the best implements, and the most improved breeds of stock are collected, change hands, and are thence distributed over the country.

But this is not the only object to be accomplished by the establishment of our Agricultural Boards and Societies. I regard the diffusion of Agricultural information as an essential mean whereby their true position is to be maintained. The field for such labor is wide, and the time opportune. Our climate calls for investigation, our entomology requires research, and our experimental farming waits application. Horticulture and rural improvement and embellishment plead their cause, and statistical information and the description of implements and of prevalent systems of husbandry demand attention.

I therefore beg to recommend that an annual volume be caused to be prepared by the Minister of Agriculture, to be a digest of agricultural information collected by him, and to embrace the reports and proceedings of the Boards in each section of the Province. Facts are chiefly to be valued. Observation and experiment should constitute the basis of each treatise, thereby affording the means to corroborate the statements propounded.

The statistics of cultivation are eminently worthy the attention of our Boards. For the convenience of those Societies desirous of improving their agriculture in future years, I beg to insert a form of table which, when filled, will present a concise exposition of their annual returns.

I may here refer the farmer's attention to the series of questions in the Appendix, answers to which would serve to illustrate the practice of particular localities.

Estimate of the principal Products of the Township of County of 185

Products.	Acres cultivated.	Seed per Acre—Bushels.	Quantity raised per Acre—Bushels.	Cost per Acre.	Whole quantity in 185 .	Whole cost.	Value at the Market rates.	Profit.	Profit per Acre.	Profit per Bushel.
Wheat										
Barley										
Oats										
Rye										
Buckwheat										
Indian Corn										
Potatoes										
Turnips										
Beans										
Peas										
Flax										
Hay										
Grass Seeds										

From this table the average profit per acre will be easily calculated, and the profit per cent. on the value of each farm.

As kindred subjects to this branch of inquiry, the feeding of stock and the experience of breeders as to the adaptation of any particular race to certain localities are deserving of study. Are we able as breeders and farmers to perpetuate the fine forms of the Short-horn bull, of the Leicester and South-down sheep, or of the Berkshire hog? The superiority of our horses is unquestioned; but admitting the same point of excellence in the breeding of neat cattle has not been reached we may attribute the defect to the absence hitherto of a Bakewell or a Colling, although the efforts of Ferguson, Harland, Wade, and others are approximations to the desired standard.

As a means of illustrating the practice of different localities in tillage, or the management of live stock, and of tracing their climatic influences, I would beg to direct the attention of our Boards to the execution of surveys of different counties by persons possessing the necessary qualifications. Admitting such works to be of little use or instruction to the people of older countries, they must possess a peculiar value to ourselves, even as regards posterity. While they may not indicate wide distinctions in the social habits of the people, they must necessarily disclose many points of difference in their rural economy, the causes of which, whether geological or climatic, must necessarily engage the attention of the surveyor. The routine of the farm operations of some districts will probably be found to have undergone but little change from innovation, and that of others to be but a slight modification of the best European practice, while both have their causes of retardation or progression.

The holding of fairs or markets at stated periods in County Towns has been under the notice of the Agricultural Office. They are undoubtedly desirable for the sale of grain and stock, and materially serve the interests of those farmers in their immediate neighborhood. Hitherto Government has liberally encouraged all applications from localities which would obviously benefit from their establishment.

I now beg to refer to the 16 Victoria, cap. 11, sec. 16. It is a concise statement of the expectant perfection of an agricultural system hardly attainable. The approbation of the Minister of Agriculture necessarily implies an appropriation of the public moneys. With this approbation each Board may set in operation a model or experimental farm.

Since the establishment of a Department of Agriculture many propositions have been made and many plans received relative to model farms. That such institutions have effected much good in other countries is beyond question, but that

their profits have been greater or their acreable returns larger than those of individual farms has not been determined. Such, however, is not, properly speaking, their object, it being to impart to young men a knowledge of the science as well as of the art of agriculture. With this, other branches of knowledge must necessarily be combined; hence such institutions as that of Grignon, Hofwyl, or Cirencester, where instruction is given in mathematics, natural philosophy, including chemistry, geology, and mineralogy, horticulture, aboriculture, veterinary surgery, and medicine, and subjects connected with rural legislation. This course of study must require years to accomplish. It admits of no question that the alumni of these institutions have more capacity for success in farming than those who possess but practical knowledge, yet it must also be admitted that the latter, singly considered, as relating to agricultural pursuits is of greater value than science alone, and that both, when united with habits of business, are the precursors of anything but failure.

A model farm of three or four hundred acres must have buildings to correspond, including the most complete arrangements of the present day, and a literary department, with numerous chairs; the professors for which must be men of the first rank in science. I do not enter into any calculations to shew the expenditure likely to be connected with an institution established on such a scale, believing that it is not adapted to our present necessities; nor do I notice the subject of experimental farms, as the Report of the Board of Agriculture of Upper Canada will, no doubt, contain the fullest information relative to the present and future management of that in connection with the University of Toronto.

To establish Chairs of Agriculture in our leading literary institutions I conceive to be a practicable and effective method of aiding the agricultural interests of the Province. Small farms, for illustration and experiment, are appendages easily attached and very desirable. I may allude more particularly to the benefit to be derived from such adjuncts, if connected with institutions of a class similar to that of McGill College at Montreal.

To establish a Museum and an Agricultural and Horticultural Library at Toronto and Montreal respectively is the duty of each Board. The visitor will expect to find in each of these, models of agricultural implements with the names of their respective makers; the different varieties of grain and seeds, paintings of the most noted animals of each breed, and what is of much importance to the agricultural student, models in plaster of those of greatest celebrity; models of fruits and roots are also of great importance, and facilitate the acquisition of horticultural and agricultural knowledge.

These have begun to attract much attention in other countries. A valuable collection is already in the possession of the Highland Agricultural Society of Scotland, who have succeeded to the full in imitating nature in this particular branch by securing the first talent. Similar success has attended the efforts of an artist in the United States, encouraged by the New York State Agricultural Society and the Agricultural Office at Washington. The different stages of the numerous diseases caused by the attacks of insects on fruits and roots can thus be represented and preserved, and an impetus be given to fruit cultivation by making common to all the knowledge of casualties of such importance to success.

It is not my intention to animadvert upon matters of grave import attaching to the value and effect of such repositories on minds whose elementary education is of little prominence, nor to criticise those systems whose pretentions are to convey knowledge by oral instruction to minds incapable of retaining its impressions; yet such may, in some cases, be a necessity. To send out practical instructors who can contrast the successful husbandry of one parish or one individual with the carelessness and consequent poverty of another, I still hold to be a means of stimulating and improving our farmers, and beg to recommend its adoption.

In accordance with the 16th Victoria, cap. 11, sec. 6, I aimed to collect, by the means at my disposal, accurate information on different subjects within its scope.

Attempts have been made at different times and with various success to extend the cultivation of the flax plant. The climate and soil are considered favorable to its developement, but there exists an opposing cause in the absence of a ready market for the grower. With the view to collect full information of the growth and preparation of this material, an agent was sent to the British Islands and the Continent of Europe, with collateral instructions to disseminate information on the resources of the country as relating to immigration. His report is annexed herewith.

The condition of agriculture in the United States attracted my attention. The similarity of soil and climate which exists between portions of that country and our own would indicate little difference in their state of husbandry. The report of the agent sent to that country, though on a mere passing visit, will necessarily touch on this subject as well as on the adaptation of new seeds, implements, and machines to the wants of our farmers.

An inquiry has also been instituted into the causes which contribute to the comparatively imperfect practice of agriculture which is found to exist in the lower portion of the Province.

The arrangements connected with the representation of Canada at the New York Exhibition being under my direction necessarily engaged much of my attention. The character of this representation will be fully noticed in the report of the Commissioner appointed by your Excellency, and in that of my successor in office, who has completed the arrangements.

I have authorised the publication in German of a small work comprising a series of articles on the capabilities of the Province. Your Excellency's comprehensive despatch has also been published in that language. These, with several thousand copies of the Railway Map of the Province, were specially prepared for Europe, and have been forwarded and distributed.

By the 16th Victoria, cap. 11, sec. 4, the Minister of Agriculture receives all applications, descriptions, specifications, and models for or relating to Patents for inventions in the Province, and keeps the records thereof.

It has been found expedient to prepare forms for the guidance of parties making application to the office. These contain six requisites which are uniformly insisted upon before an application is considered ready for examination. These are:

1st. The petition.
2nd. The oath.
3rd. The specification and description in duplicate.
4th. The drawings in duplicate.
5th. The model or specimens in all cases which admit of them.
6th. The payment of the fee of £5.

The provisions relating to additional improvements, re-issues, disclaimers, extensions and assignments do not require special notice.

The space allotted for the arrangement of models is very inadequate to the requirements of the office, and consequently the classification hitherto attempted does not meet the approval or excite the admiration of visitors. It is desirable to collect those which are at present scattered in different places, some in the office of the Provincial Secretary, and others in Montreal. There is a separation in the continuity of the office in this respect, and a want of adhesion in its component parts. The commencement of a National Museum, however, exists in these and the splendid collection of minerals at Montreal, which can be more easily completed as soon as Parliament may determine upon a place at which to locate permanent buildings for the accommodation of the Patent and Agricultural Offices.

An easy reference to important documents is at all times extremely to be wished. No digest of Letters Patent has hitherto been published. That the objects and the practice of the Department may not be at variance, I have authorised an abstract to be compiled from the records in the Office of the Provincial Registrar, and a similar abstract of assignments issued before and after the Union of the Provinces. Its continuation will form a part of the duties of the Bureau of Agriculture in future years.

In addition to the bonds required by the 4th and 5th Victoria, cap. 91, to be given by the Minister of Agriculture, I respectfully recommend that the Chief Clerk under him shall give bonds with sureties in a sum hereafter to be fixed, with condition to render a true and faithful account of all moneys which shall be received by him for duties on Patents and for copies of records and drawings by virtue of his office ; also that in addition to the Copying Clerk already employed, an Examining Clerk be appointed, who shall be competent to execute the draughting required, and to examine and compare the records with the originals; and further, to recommend that all fees shall be accounted for by the Office instead of being transferred to the receiver of fees as is the practice at present. With these alterations, and a diligent attention to the discharge of its important duties, it may soon become self-sustaining, and cease to be a charge on the revenue.

By an Order in Council your Excellency was pleased to sanction a grant of £250 out of the contingent fund, with the the view to prosecute experiments which were likely to lead to great amelioration in the system of tillage. These are at present being perfected in England under skilful direction, and with much probability of success. A full report of the trials which have already taken place has not yet been fyled, but I am confident the result will be in accordance your Excellency's enlightened views on all subjects connected with agricultural progress.

I have thus cursorily alluded to the different subjects which have occupied my attention during the short time I held the Office of Minister of Agriculture.

For the convenience of the office itself, I endeavored to collect the works of standard authors on those subjects which more immediately engage its attention, and to arrange for the regular transmission of the leading agricultural periodicals of Europe, and those now published and ably conducted in Upper and Lower Canada, to which I think some more tangible aid should be rendered than has yet been given.

It may be found necessary to amend the Agricultural Acts where their wording and working are not found to harmonise. The appropriation of the Legislative grant to Sectional Societies in Counties in Lower Canada offers occasional embarrassment, arising chiefly from their number, and the great disproportion in their respective population.

But these, and all other alterations herein recommended, I leave for my successor in office, who happily is better able than myself to do justice to this important Department.

I have the honor to be,
Your Excellency's most obedient servant,

MALCOLM CAMERON.

APPENDIX.

CIRCULAR OF AGRICULTURAL QUERIES FROM THE MINISTER OF AGRICULTURE.

Name of party interrogated?
Residence?

Land.

Is it stony or otherwise?
Is it hilly, rolling, or flat?
How watered?
How wooded?
Remarks.

Wheat.

Varieties in use?
Time of seeding?
Time of harvesting?
Preparation of seed?
Quantity used per acre?
Average product per acre?
Weight per bushel?
How many times do you plough?
How deep?
Is the yield per acre increasing or diminishing?
Does your crop suffer from insects or disease?
Which variety is least liable to injury?
Where is your nearest market?
The average price per bushel?
Do you sow grass seeds with your wheat?
What kinds?
When?
System of rotation in crops?
Manure or fertilizer most used?
Mode of application?
Remarks.

Corn.

Varieties in use?
Time of seeding?
Time of harvesting?
Preparation of seed?
Quantity used per acre?
Yield per acre?
Weight per bushel?
Cost of production per bushel?
System of culture?
How capable of improvement?
Best method of feeding?
Manure or fertilizer used?
How applied?
Preparation of ground for planting
Distance between rows?
Distance between stalks?
Remarks.

Oats, Barley, Rye, Peas, and Beans.

Average yield of these several crops per acre?
Oats?
Barley?
Rye?
Peas?
Beans?
Which crop is least exhausting to land?
Remarks.

Clover and Grass Seed.

Quantity of hay cut per acre?
What grass seeds preferred in laying down meadows?
Quantity sown per acre?
Cost of young hay per ton?
What does your experience show on horses fed on clover?
Best fertilizer for meadows and pastures?
Remarks.

Root Crops.

Turnips, Carrots, Beet, &c.

Is the cultivation of these roots as a field crop on the increase?
Can you suggest any improvement in preparing land for seeding?
Do. do. after tillage?
Do. do. feeding?
Average yield per acre—Turnips?
Do. do. Carrots?
Do. do. Beet?
Remarks.

Potatoes.

The most prolific and profitable varieties?
Best system of planting?
Best system of tillage?
Best system of manuring?
Preserving through winter?
Average yield per acre?
Cost of production per bushel?
Best preventive to rot?
Remarks.

Tobacco.

Process of cultivation?
Best crops in rotation to maintain fertility?
Cost of production per cwt. or hhd.?
Process of curing?
Fertilizer used?
Remarks.

Flax.

Process of culture?
Yield per acre?
Cost of production per lb.?
What use is made of the surplus seed?
What preparation of the straw for the market
How disposed of?
Remarks.

Hemp.

Process of culture?
Yield per acre?
Cost of production per lb.?
What preparation do you make for the market?
How disposed of?
Remarks.

Fruit.

What kinds are cultivated to any extent?
Are not apples considered a very profitable crop to the farmer?
Comparative value of apples and potatoes for feeding hogs and cattle?
Best varieties for winter use and market?
Remedy for "blight" on pear or apple trees, or "yellows" on peach trees?
Best method of transplanting?
Best method of budding?
Best method of grafting?
Remarks.

Maple Sugar.

Best time for tapping?
How often can a tree bear tapping without injury?
Average yield of each tree?
Best mode of making?
Remarks.

Dairy.

Average yearly produce of butter per cow?
Cheese per cow?
Cost per lb. of making butter?
Do. do. cheese?
Treatment of milk and cream?
Mode of churning?
Mode of packing butter for market?
Remorks.

Neat Cattle.

Cost of rearing till three years old?
Usual price at that age?
Value of good dairy cows in Spring and Fall?
Breed best adapted to climate?
Breed having good qualities for the butcher, dairy, and draught?
Your method of breaking steers for the yoke?
Remarks.

Horses.

Is the rearing profitable?
Expense of rearing until three years old?
Treatment of brood mares and colts?
Method of breaking young horses for service?
Remarks.

Sheep.

Are sheep considered profitable?
Best breed for locality as regards both mutton and wool?
Average weight per fleece, fine or coarse?
Cost of producing a lb.?
Market value of sheep?
Do. do. lambs?
Do. do. wool per lb.?
Remarks.

Hogs.

Best breed?
Best and cheapest method of producing pork?
Do. do. do. bacon?
How many pounds of meat will 100lbs of corn yield?
Best method of putting up and curing hams and bacon?
Remarks.

Manures.

Best plan of making manure and preserving from waste?
Are guano, plaster, and lime used as fertilisers?
If so in what quantity per acre?
How applied?
Remarks.

Drainage.

What amount have you?
What description?
Materials used?
How far apart are the drains?
What is their depth?
Expense per rod?
How far do you consider it necessary and profitable?
Remarks.

Irrigation.

Do you practice it?
To what extent?
What information can you give on the subject?

Domestic Manufactures.

What articles are made from produce of farm?
Whither for home use or for market?
Remarks.

Agricultural Implements.

Are any of the following in use? viz.
Reaping and mowing machines?
Ploughs—kinds?
Sub-soil ploughs?
Cultivator?
Harrows?
Horse rakes?
Remarks.

REPORT

On the system of Cultivation and preparation of the Flax, as practised in Belgium and the British Islands.

To the Honorable John Rolph, Minister of Agriculture, &c., &c., &c.

Quebec, 1*st October*, 1854.

Sir,—I have the honor to submit, for your information, the following Report on the systems of cultivation and preparation of Flax, as practised at the present time in Belgium and the British Islands.

Agreeably to the instructions received from your predecessor in office, I visited these countries, with a view to collect the information desired, and to a more extended cultivation of the flax plant in Canada; the practical bearing of which, on the industrial resources of the country, will not fail to attract your attention.

I have to acknowledge my obligations to the following gentlemen for kindly supplying me with valuable aid and information; to Sir R. Kane, Professor Hodges, W. K. Sullivan, J. Macadam, Secretary to the Royal Society for the Promotion and Improvement of the Growth of Flax in Ireland, Arthur Marshall, J. C. Wilson, Major Larcom, E. Singleton, M. Paton, Professor Ryan, Messrs. Leadbetter & Co and T. J. Howell.

It appears, from the returns of the census of 1852, that the quantity of Flax or Hemp produced in Lower Canada, was 1,867,016 lbs., and in Upper Canada, 50,650 lbs. Assuming these returns to be correct, and that they represent Flax alone, an aggregate yield of 856 tons is exhibited.

The number of acres of Flax under cultivation, in either Province, is not given, nor the quantity of land held by those who generally cultivate this plant. But the number of occupiers of land is stated, from which we learn that the holders of from 50 to 100 acres, both in the Upper and Lower Province, are by far the most numerous class.

The agricultural returns of the census of Ireland, for the year 1851, indicate that the greatest extent of Flax is grown upon holdings, from 5 to 15, and from 15 to 30 acres, and the number of holders above 5 and not exceeding 15 acres, is shown to have been in that year, 191,854, being the largest in any class. If a similar relation exists in this country, a general cultivation of Flax in the Lower Province, may be inferred.

Estimating the produce of fibre per acre at the average yield in Ireland, the breadth of land occupied by Flax would be:—

In Upper Canada.....	92	statute acres,
In Lower Canada.....	3,334	do.
Total.....	3,426	

The quantity of Linens manufactured in 1852 is given as follows:—

In Upper Canada.....	14,955 Yards.
In Lower Canada.....	889,523 do.
Total.....	904,478 Yards.

Calculating this at 1s. per yard, unbleached, the entire value made would be £45,224.

In addition to the seed of the Flax crop consumed in the country, there is an Export to Great Britain and the United States. This was:—

In 1850.....	21,159 bushels	..... Value,	£5,469 1 5
In 1851.....	8,021 "	..... "	1,960 8 9
In 1852.....	20,380 "	..... "	4,842 3 10

Imports of Linen Fabrics into Canada:—

	From Great Britain and Ireland.			Via United States.			From Foreign Countries.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1850	58,455	5	6	10,085	0	2	22	13	7	68,562	19	3
1851	102,436	13	7	11,198	9	5	2	16	0	113,637	19	0
1852	75,734	15	6	8,376	4	6	64	4	0	84,175	4	0

The consumption of Linens of all kinds may be stated at £180,000, annually. Our population being 1,842,265, this would be equal to 1s. 10d per head.

With a view to test the quality of Canadian Flax as compared with the European article, a small quantity was prepared in Scotland by the improved Schenck's process, and another by the later method of Watt.

It may properly be mentioned here, that, for profitable cultivation, length of fibre is the first object to secure, fineness being next in importance. If the plant is cultivated for seed mainly, fineness is a secondary consideration, indeed, is not to be expected.

The Canadian sample possessed sufficient length, but was deficient in quality, as the following correspondence will explain:—

Redford Flax Factory,
Thornton, Kirkcaldy,
May 25th, 1853.

John C. Wilson, Esq.

Dear Sir,—I submit for your examination a sample of Lower Canadian Flax Straw.

The sample presented was grown on land that was mown for four years and pastured for one, before breaking up.

The soil was a deep rich loam, ploughed but once in spring, harrowed, and sown immediately after, it being the 7th May. Weeding was neglected, and the Flax pulled on the 15th August.

The seed was allowed to ripen, or to turn blackish in the bolls, the straw being changed in color throughout its length.

Rippling and pulling proceeded simultaneously. The straw, after rippling, lay for two days, loosely, in the field, was atterwards bound in small bundles and stooked until sufficiently dry for stacking.

I would esteem it a favor if you would pass it through the usual operations, and oblige me with your opinion of its yield and quality.

I am,
Dear Sir,
Your obedient servant,

A. KIRKWOOD.

Reply:

Redford Flax Factory,
Thornton, Kirkcaldy,
May 30th, 1853.

A. Kirkwood.

Dear Sir,—I have examined your sample of Canadian Straw, which is a fair article, and suitable for our process of steeping.

It is not a straw that will bear much expense in manufacturing, for it does not possess quality sufficient to repay that, but if produced at a cost of £3 per ton of straw, and wages expended on it to the extent of about £10 or £12 per ton of dressed Flax, I have no doubt but that the manufacture would be found profitable, where the dressed Flax can be sold at from £40 to £42 per ton.

Yours truly,

JOHN C. WILSON.

The deficiency in the quality of this Straw may be attributed to want of due preparation of soil, to thin sowing, neglect in after cultivation, and an over-ripening of the seed.

Its method of preparation was as follows:—Steeped for sixty-two hours in an over-flowing vat, at a temperature of 90° Fah., wet, and steam rolled, dried in the open air, one-half scutched by mill, and the other by machine.

Mill Scutched.

	Lbs.	Ozs.
Weight before Scutching.....	2	2
Do. after Do.....		6

Yield per cent., 17.6.

Machine Scutched.

Weight before Scutching.....	2	2
Do. after Do.....		9

Yield per cent., 26.4.

The climate and soil of Canada are considered to be well adapted to the growth of Flax.

The greatest development of the plant in Europe is exhibited between the 42nd and 60th parallels of latitude. The shortness of season and heat of more northern regions being unfavorable to the production of a fine fibre.

On the other hand, a more southern, and, consequently, a hotter climate, produces a plumper and more oily seed,—that from India containing about 28 per cent. of oil, while Baltic seed yields but 22 per cent.

A general survey of the chief Flax producing districts in Europe indicates a range where humidity of climate chiefly prevails; a large supply of moisture being essential to the elaboration of the constituents of the fibre, which are mainly derived from an atmospheric source.

Accordingly, we find that those countries which are celebrated both for their quantity and quality of Flax are well adapted, from their geographical position, to insure that large supply of moisture in which this plant luxuriates.

The tendency of Flax to seek littoral regions is strikingly exemplified in France. The following Table was compiled to show the distribution of Flax culture throughout that country.

The returns are from Statistics furnished in 1842, being the latest made:

Groupe I.

	Departments.	Acres.	Acres.
Atlantic Coast.	Nord	25,565	
	Pas-de-Calais	11,803	
	Somme	12,168	
	Seine-Inférieure	10,533	
	Calvados	1,500	
	Manche	16,455	
	Ille-et-Vilaine	11,003	
	Côtes-du-Nord	19,223	
	Finistère	9,740	
	Morbihan	2,633	
	Loire-Inférieure	8,295	
	Eure	7,927	
	Vendé	8,273	
	Charante-Inférieure	2,293	
	Gironde	620	
	Landes	7,400	
			162,431

Groupe II.

Spanish Frontier.	Basses-Pyrénés	6,995	
	Hautes-Pyrénés	5,163	
	Haute-Garonne	6,673	
	Ariége	4,943	
			23,774

Groupe III.

Bordering on the two foregoing.	Aisne	2,940	
	Mayenne	9,158	
	Maine-et-Loire	9,568	
	Lot-et-Garonne	2,543	
	Gers	8,908	
	Tarn-et-Garonne	3,465	
			36,582

Groupe IV.

Eastern and North-Eastern Frontiers.	Ardennes	675	
	Meuse	1,688	
	Moselle	1,855	
	Bas-Rhin	510	
	Haut-Rhin	148	
	Doubs	1,063	
	Jura	43	
	Ain	17	
	Hautes-Alpes	15	
			6,014

Groupe V.

Mediterranean Coast.	Herault	93	
	Aude	1,090	
	Pyrénées-Orientales	438	
	Corsica	1,427	
			3,048

Groupe VI.

Interior.	North-Eastern.	Marne	65	
		Meurthe	1,422	
		Vosges	2,345	
		Cote-d'Or	40	
		Haute-Saône	185	
		Cher	28	
	North-Western.	Oise	175	
		Orne	2,040	
		Eure-et-Loire	105	
		Loire	153	
		Sarthe	270	
		Loir-et-Cher	325	
		Indre-et-Loire	33	
	South-Eastern.	Allier	5	
		Puy-de-Dôme	232	
		Loiret	20	
		Cantal	60	
		Aveyron	658	
	South-Western.	Deux Sevres	1,853	
		Vienne	173	
		Charente	870	
		Haute-Vienne	580	
		Dordogne	405	
		Corrèze	1,005	
		Lot	765	
		Tarn	2,175	
				15,987
		Total		247,836

The yield of the Flax crop in France is estimated by M. Mareau in his Report to the French Government, to average 500 kilogrammes of scutched Flax, per hectare, or rather more than 4 cwt. per acre, which would give, as the entire produce nearly 50,000 tons. The value is given at an average of 1 franc 15 centimes per kilo., or about £58 per ton, making the value of the entire crop reach £2,920,000. Adding the value of the seed which is taken at 19,451,916 francs or £946,658, the total yield, in marketable produce of fibre and seed, would be £3,866,658.

A variety of Flax with white flowers is mentioned by M. Mareau, which is said to possess the following advantages:—1st. Its hardiness, and ascertained success on soils of such inferior quality as to be totally unsuited to the growth of the ordinary blue-flowered Flax: 2nd. Its yield of fibre being greater, by eight per cent. than the latter: 3rd. Its produce of seed being more than double that of the other.

Great Britain and Ireland, from their insular position, are particularly adapted for Flax culture. The statistics of Flax cultivation as compared with the Map of Europe, illustrate the general correctness of the principle of humidity. Beginning with the most South-Western portion of the Continent, we find Portugal, and the Provinces of Spain which lie on the Bay of Biscay, producing a certain quantity of Flax, while the proportion grown in the interior of the Peninsula is very small.

We have already seen the growth of the plant in France to lie along the entire Atlantic margin.

Entering Belgium, we find its maritime Provinces of East and West Flanders and Antwerp, to be the great seat of its culture. Passing the Dutch frontier, Friesland and Zealand, on the German Ocean, are the principal Flax districts. When we enter the Baltic, we find Hanover and Prussia, and the Russian Provinces of Courland, Riga, Pskow, Revel, and Petersburgh, furnishing tho bulk of the Flax for shipment.

The following table, compiled by Mr. MacAdam, Secretary to the Royal Flax Improvement Society of Ireland, shows the average yearly produce of the chief Flax growing countries:

	Tons.
Russia	150,000
Austria	65,000
The Zollverein States	60,000
France	55,000
Belgium	30,000
Holland	16,000
Great Britain and Ireland	40,000
Scandinavia	10,000
Spain and Portugal	4,000
Italian States	12,000
Turkey	5,000
North-America	2,000
Egypt	3,000
Total	452,000

This quantity would occupy a breadth of about 1,800,000 acres and at £60 per ton would be worth £27,120,000 in the state of fibre. It is calculated that the fibre enters to the extent of one-third into the value of the fabric, and on this estimate, the total annual value of the linen fabrics manufactured and consumed throughout the world, would appear to be upwards of £80,000,000.

Next to climate, soil is of importance in the cultivation of Flax, and in this country there is abundance well suited to the requirements of the plant.

In 1847, Sir Robert Kane read before a meeting of the Royal Dublin Society a paper, entitled, "Researches on the composition of certain soils and waters belonging to the Flax districts of Belgium, and on the chemical constitution of the ashes of the Flax plant." The main object in the inquiry was to ascertain, if possible, whether there existed any difference between the composition of the ashes of the ordinary Flax in Ireland, and the Flax grown in those localities in Belgium, where the plant is known to yield a fibre of so much commercial value. Further, to ascertain the composition of the soils of those districts, in order to compare them with the soils of the localities in Ireland, where Flax is, or may be successfully cultivated. And as it is known that in the preparation of the fibre, the most important stage consists in the steeping or retting of the plant, it was of the greatest interest to trace, if possible, whether the superior qualities of some rivers or ponds in Belgium could be connected with any peculiarity of chemical constitution.

The general character of all the soils submitted to examination was that of light sandy loams, in some cases almost purely sandy; excessively loose in texture, non-coherent, and permeable; usually rich in organic matters containing nitrogen.

Soil from Escamaffles, some of the very best Flax lands of the Courtrai district:

	Composition per Cent.
Potash	0.123
Soda	0.146
Peroxide of Iron	1.663
Oxide of Manganése	A trace
Alumina	1.383
Lime	0.227
Magnesia	0.153
Sulphuric Acid	0.017
Phosphoric Acid	0.152
Chloride of Sodium	0.030
Organic matter and Water not driven off at 212°	2.361
Clay	9.280
Sand	84.065
	99.600
Loss	.400
	100.000

Soil from Hamme Zog, the best Flax land in the Antwerp district:—

	Composition per Cent.
Potash	0.068
Soda	0.110
Peroxide of Iron	1.202
Oxide of Maganese	A trace
Alumina	1.125
Lime	0.481
Magnesia	0.140
Sulphuric Acid	0.013
Phosphoric Acid	0.064

Chloride of Sodium	0.067
Organic matter and Water not expelled at 212°	4.209
Clay	5.760
Sand	86.797
	99.975
Loss	.025
	100.000

To show the variation of some of the leading constituents in Flax soils, the following Table is taken from analyses made by Kane, Mayer, and Brazier :—

Per Cent. of	Russia.		Belgium.		Holland.	Ireland.	
	Livonia.	Lithuania.	Hesteert.	Duffel.		Co.Derry.	Armagh.
Silica	79 34	85.09	75.08	92.78	64 94	64.94	73.72
Lime	Traces	.89	.35	.35	3.04	3,04	1.67
Alumina	11.62	2.24	2.10	.48	6.65	6.65	8.97
Iron	Traces	Traces	3.29	1.20	60	.60	.31

By these analytical results it is abundantly evident how completely due to artificial means is the fertility of those different Belgian soils. The large quantity of azotised organic matter, the proportionally large quantities of phosphoric acid and magnesia, and of the alkalies, being evidently the result of the copious treatment with animal manners, to which, as all persons conversant with Flemish agriculture are aware, the soil of Belgium is subjected. The duty, so important in the preparation of soils for Flax, of dividing it to the finest possible state, and rendering it perfectly friable and porous, is naturally effected in the Belgian soils, of which a well-manured incoherant sand, might be more correctly the title, few of them containing as much clay as would justify the title of a light loam. There is, therefore, no doubt but that the soils most adapted for the successful growth of Flax are of this very light and porous character ; and that in the selection of districts in this country into which the Flax culture may be extended, this quality of lightness and permeability of soil is of the first importance. It is worthy of attention that the soil of the districts which have been longest and best known for the production of good Flax, have but a mere trace of lime in their constitution.

Much difference of opinion still prevails as to the exhausting properties of this plant. In the analyses of the stem made by Sir R. Kane, the quantity of phosphoric acid found in the ashes forms a peculiar characteristic. The following are the per centages of phosphoric acid in the ash yielded by the stems of other plants :—

Tobacco stalk and leaves	2.73
Wheat stems	3.10
Oat stems	3.00
Clover plants	6.30

whilst the average of the analyses of Belgian and Dutch Flax ashes show that that there are present no less than 10.77 per cent.

Professor Hodges remarks that this plan of comparing the exhausting effects of these crops, is not the most instructive way for the farmer to look at the question. It is only when we consider the amount of the valuable matters of the

soil, which the ordinary produce of the usual crops takes away from an acre of land, that we can judge of the effect, which their production must exercise upon the stock of matters contained in the soil; and, consequently, the degree of exhaustion which they occasion. The ordinary produce of one Statute acre of the following crops takes away from the soil:—

	Total.	Phosphoric Acid.	Potash.
Flax straw, 2 tons, yield of inorganic matter	224 lbs.	contain 15½ lbs.	14 lbs.
The tops of 12 tons potatoes	270 "	" 20½ "	77½ "
The tops of 25 tons turnips	387½ "	" 36 "	111 "
Sixty bushels of Flax bolls, dried, weigh 960 lbs	48 } 272	18 } 33½	11 } 25
The ash of the straw	224 }	15½ }	14 }
Twelve tons of potatoes, stalks, and tubers.	870	96	409
Twenty-five tons of turnips, tops, and bulbs	812	68	289

It appears, therefore, from the above table, that the ordinary produce of Flax takes away, per acre, a less amount of valuable ingredients than either the turnip or the potato. If we apply a proper manure to the soil, and the Flax bolls be used for feeding, and thus added to the manure heap, all the mineral ingredients which the crop takes away may be perfectly restored, and the exhausting effects of the cultivation of the plant removed, without the necessity of having recourse to the generally impracticable methods which have been insisted upon as necessary for that purpose.

The quality of the water in which Flax should, if possible, be retted, is of such importance, that analyses by Kane of the most celebrated steeping waters may be quoted:—No. 1. Water from one of the best blue retting pits, near Hamme Zog, in Belgium. This water is supplied from the Scheldt annually, before the retting season commences, and left to stand in the pits for six or eight weeks. 100,000 grains left by evaporation, 139.69 grains of solid matter, of ochrey appearance, and consisting per cent. of:—

Protoxide of Iron	6.663
Lime	8.435
Magnesia	1.369
Soda	11.607
Potash	4.181
Sulphuric acid	8.435
Muriatic acid	8.682
Phosphoric acid	No trace
Carbonic acid with organic matter and loss	50.658
	100.000

No. 2. This water is from the River Lys, so celebrated for its steeping qualities. 100.000 grains, evaporated to dryness left a residue of 45.11 grains, consisting of, in 100 parts:—

Protoxide of Iron	6.200
Lime	5.484
Magnesia	1.192
Soda	28.298

Potash	5.405
Sulphuric acid	9.300
Muriatic acid	7.754
Phosphoric acid	.079
Carbonic acid with organic matter and loss	36.288
	100.000

The analyser remarks, that in these samples, which are of the most remarkable and celebrated steeping waters in Belgium, a large quantity of iron is present, so that they might be in a degree termed chalybeate waters. How this regards their excellence for preparing Flax he does not pretend to say, and, indeed, it will require much more extended investigation before a satisfactory solution of it can be given.

When the stem of a Flax plant is examined, it is found to consist of three parts; first, a woody central hollow collumn, termed the shove, which is composed of cellular tissue; second, of a tubular sheath, composed of long and firm cells, this constitutes the fibre, which, though apparently clean, will, on microscopic examination, be found coated with a gummy or resinous matter, which prevents the separation of the minute filaments; and, thirdly, of a delicate covering of epidermis.

To separate this fibre from the worthless parts connected with it, is the first step in its preparation, and nearly all the methods of accomplishing this, involve the process of fermentation. Steeping is generally resorted to, the action and results of which are well known by the popular term, retting or rotting. This operation will be more minutely described in a subsequent page.

Although no difficulty presents itself, to the growth of Flax in this country, or to its subsequent preparation by steeping in pools or streams, an extended cultivation is not to be expected in the absence of scutching machinery. Hand scutching is a tedious operation, and one not likely to be introduced into many parts of the Province, although numbering many advocates in countries where there is an abundant rural population.

The erection of mills for scutching is desirable. In these, the farmer can have his Flax prepared in a shorter time, and at a reasonable charge.

A system of Flax Factorship exists in Belgium, which involves a division of labor, and no doubt contributes in a great measure to the excellence of the Flax produced in that country. It is carried on by Joint-Stock Companies, or individuals possessing capital, who either rent land labored by the farmer, and ready for the seed, or when the plant is in flower, purchase the Flax crop on the foot, and at once relieve the farmer of all further responsibility respecting it, giving him his cash in hand, or approved bills at three months; receiving no further aid from him than such accommodation as may be required.

The farmer thus has but to grow the crop to the utmost perfection that good culture, the peculiarities of his soil, seed, and seasons will admit of. The Flax Factor's attention is then exclusively devoted to its after management, and the laborers employed by him soon become expert under his skilful superintendence in their peculiar branch of business, from the right system of pulling, to that of the last handling required.

But the preparation of Flax has lately been reduced to a system which, though somewhat resembling the last, differs from it in the kind of machinery employed. Buildings, involving an expenditure of from £1,000 to £20,000 are erected. These are known by the name of retteries, and contain apparatus for

the seeding, steeping, drying, and scutching of the raw material. The Flax straw is purchased from the farmer by these factories, at a certain rate per ton, not in a green, but in a dry state.

I am indebted to the Census Office in Ireland for returns of agricultural produce in that country for the years 1851 and 1852. The extent of Flax cultivated in Ireland in 1852, was 136,844 acres, being 3,692 acres less than that grown in 1851; the decrease is observable throughout every county, with the exception of five. The want of scutch mills for preparing Flax has, no doubt, checked the desire for the growth of this crop in many districts.

The average rate of produce of Flax in 1852 was 42.2 stones per acre, being an increase of 3.6 stones per acre on the rate of produce of the preceding year; this improvement in the crop of 1852 more than compensated for the diminished area cultivated, causing the total quantity of produce in 1852 to exceed that in 1851 by 2.272 tons.

The great importance attending the cultivation of Flax led to inquiries in 1852, respecting the number of scutch mills; the result shows that there are 966 mills of this description in Ireland.

The following summary gives the number of scutch mills in each Province, classified according to the number of "*Stocks*" or "*Handles*" in each:—

Provinces.	Number of Mills.					
	Having 2, 3, or 4 Stocks.	Having 5 or 6 Stocks.	Having above 6 but not exceeding 12 Stocks.	Having above 12 but not exceeding 18 Stocks.	Having above 18 Stocks.	Total.
Leinster.....	9	3	5	1	1	19
Munster.....	3	3	5	1	3	15
Ulster.....	596	173	141	10	6	926
Connaught.....	2	1	2	1	0	6

In 1852, a Bill was carried through the Imperial Parliament, by Lord Naas, M. P., then Chief Secretary for Ireland, enabling landed proprietors to borrow money from the Treasury, under the Land Improvement Advances Act, for the buildings, water-courses and dams of scutch-mills.

The following instructions have been issued, by the Lords Commissioners of Her Majesty's Treasury, for the guidance of the Commissioners of Public Works, with respect to loans to be made for the erection of scutch-mills for flax, in Ireland; and no loan can be made, unless in accordance therewith.

"1. All buildings to be executed according to plans and specifications approved of by the Commissioners of Public Works.

"2. Loans to be confined to the erection of buildings, consisting of substantial stone or brick walls, with slated roofs, and suitable doors and windows, and to the formation of water-courses and weirs, necessary for providing water-power for the mills. The internal fitments and machinery of all kinds to be provided by the applicant out of his own funds.

" 3. No loan to exceed £500 stg., without the special authority, in each case, of the Lords Commissioners of Her Majesty's Treasury.

" 4. No loans to be made for dwelling-houses, or for repairing or enlarging old buildings, or raising on old walls or foundations.

" 5. The loan, in each case, to be issued in five or more instalments, and no instalment, after the first, to be paid, until satisfactory proof has been given of the due completion of that portion of the works, the expense of which was to be defrayed out of the previous instalment.

" 6. No loan to be made, unless it shall appear that the lands to be charged are of ample value.

ESTIMATE OF EXPENSE OF ERECTION OF A SCUTCH-MILL, (IN ONE STORE,)

In accordance with the Plans and Specifications, furnished by the Board of Public Works. (*The rates are in sterling.*)

Description of Work.	Quantity.	Rate.	
		s. d.	£ s. d.
Excavation ... ... Removing same	26 cubic yards...	0 3	0 6 6
Masonry, dry, ...	10 yards ...	3 0	1 10 0
Do in mortar...	70 yards ...	5 0	17 10 0
Do labor only, in deductions for Opes	16 yards ...	2 0	1 12 0
Brick work	15⅓ yards ...	12 0	9 2 5
Do in cement	... ...	... ...	... ...
Extra on Brick Arches	176⅛ super. feet ...	0 2	1 9 4
Paving or Flagging...	65 yards ...	0 9	2 8 9
Roofing, per square...	9⅙ squares ...	5 0	16 6 8
Gates and Frames per foot, superficial	72 feet ...	2 0	7 4 0
Doors and Frames	52 feet ...	0 10	2 3 4
Sashes and Frames...	100 feet ...	1 6	7 10 0
Floor and Joists	4 squares ...	6 0	12 0 0
Lintels	35 feet lineal ...	0 5	0 14 7
Breastsummers	9 feet 4 inches	0 9	0 7 1
Slating	10⅛ squares ...	35 0	17 14 4
Ridge Files	78 feet ...	0 6	1 19 0
Painting	... ...	... ...	1 0 0
Total...	... ...	... ...	£100 18 0

The ingenuity of inventors has long been at work to perfect a machine to supersede the old scutching stock.

In retteries, the dependence of the manufacturer on skilled labor for scutching, was found to be a great inconvenience, from the frequent combinations for high wages.

A machine has been lately brought into notice by MacAdam, Brothers, & Co., Belfast, which is, as yet, the nearest approach to perfection that has appeared. Cost, £180 stg.

The flax straw, after rolling, is spread thinly between two ropes, which are kept at a great tension, and is by them held fast, and carried on to a set of beaters or scutch-blades, which clean the lower half of the flax. The continued movement of the ropes brings the flax to a part of the machine, where, by an ingenious, yet simple contrivance, the position of the flax is reversed. The unscutched ends are then presented to another set of scutch-blades, which complete the process. At the trial made by the Sub-Committee of the Flax Society, 47lbs. of steeped straw were scutched in nine minutes, and yielded 9lbs. 13oz. of fibre. This yield was at the rate of 23lbs. 6oz. of fibre, to the 112lbs. of straw, and the amount of work done, equal to 49 stones per day, of twelve working hours. To turn out

the same quantity, in ordinary scutch-mills, would require eight stands, so that McBride's machine would appear to replace eight trained scutchers, by three unskilled hands.

The following table shows the number of spindles in the flax-factories of the respective countries.

	Spindles.
In Ireland	506,000
England	345,000
Scotland	303,000
France	390,000
Belgium	102,000
Zollverein	80,000
Austria	74,000
Russia	50,000
United States	14,000
Switzerland	8,000
Holland	6,000
Spain	6,000

In 1793, the first flax-spinning machinery was erected in England. In 1805, the first flax-spinning mill was put up in Ireland. In 1841, there were 41 Irish factortes, with 260,000 spindles. In 1853, there are 90 factories, with 506,000 spindles, representing a capital of £2,250,000, sunk in buildings and machinery.

Says Mr. Howell, one of the Factory Inspectors of the United Kingdom, in his Report to the Secretary of State for the Home Department, "so rapid is the extension of business in the flax-spinning district, that I have good reason to believe, that materials collected for the purpose of showing the present condition of the flax mills of Ireland, speedily become obselete, in consequence of the increase of the works in operation.

Taking the number of persons employed in the factories, together with those employed in weaving, in bleaching operations, in foundries, in machine shops, and other occupations incidental to the flax manufacture, probably not less than 200,000 are actually employed in connection with the trade.

There are actully employed in the spinning mills, about 7 persons for each 100 spindles in operation, and if the manufacture of linen increases in proportion to the increase in the production of linen yarn, it will add a fourth or a fifth to the numbers already dependent on the trade.

This prosperity, nay, the existence of the manufacture in Ireland, was due to the substitution of machinery for manual labor in the operation of spinning. Circumstances have now arisen, which show that if this prosperity is to be maintained, the application of machinery must be still further extended, and it is evident that the general substitution of the power loom for the hand loom, cannot much longer be delayed."

The supply of the raw material produced in Great Britain and Ireland, for this trade, is not adequate to the demand. It will be seen from the Trade and Navigation returns of the United Kingdom, that for the twelve months, ended 5th Jan., 1853, there were imported, of flax 1,402,267 cwts., or 70,113 tons, which, at £60 per ton, would represent an expenditure of £4,206,780.

Different methods of flax preparation.

The dry system.

Patents have at various times been taken out for the separation of the fibre of flax from the wood, by mechanical means.

The plan was la'ely revived by Mr. Donlan, and the following opinion of the process, is given by the Royal Flax Society.

"The attempts which are on record of different revivals of the dry process fully prove that there is nothing new in Mr. Donlan's proposal. In 1815, the Irish Linen Board adopted the dry preparation, then brought forward by Mr. Lee, and the records of that Board show, that its principle was almost identical with that now proposed by Mr. Donlan. The most sanguine expectations were entertained of it. The very arguments now used in favor of Donlan's mode were then stated, namely, that a larger yield of fibre was obtained by it, that the coloring matter was discharged by the most simple means, that greater strength was obtained, and less tow produced. The result was, that, after an expenditure of £6,000, in introducing the system throughout the country, the Linen Board abandoned it, in consequence of insuperable defects. Your Sub-Committee are of opinion, that the fatal defect of flax fibre separated by the dry process, consists in the retention of the gummy and albuminous matter incorporated with the fibre."

We are told by Dr. Hodges, that the partial preparation of the straw in this manner was likely to be most advantageously combined with the hot water process, but that experiments lately made tend to show that the previous partial separation of the woody matter of the straw, instead of shortening the steeping process has a decidedly opposite effect.

The system, however, has not been abandoned, an establishment for the dry preparation of fibre being at present in operation at Cork. The prisoners of the Cork county jail are also employed in the process, and in manufacturing from the fibre, coarse articles for their own use.

It is a generally expressed opinion, that although much trouble and expense be saved by this dry system, and inferior qualities of straw be more properly treated by it than by steeping, yet it would be highly injudicious so to prepare good qualities, since the difference between £30 per ton for the dry fibre, and £80 to £110, for the best kinds of steeped fibre, would be too great a sacrifice.

The use of the fibre so prepared, has been properly restricted to purposes where the yarns are dry spun, and the fabrics not bleached, and in many cases further secured against deteriorating agencies, by being coated with oil, pitch, or paint, as in the case of tarpaulins, railway truck covers, &c.

Cultivation of flax in Belgium, and methods of steeping.

The breadth of land devoted to flax, in Belgium, was, in 1840, according to Mr. Mareau, 41,000 hectares, (or 99,000 acres,) 1hectare = 2 acres, 1 rood, 35 perches. Since that period the growth has increased in the districts producing the finer qualaties, but has decreased in the Walloon countries, and others which yield inferior qualities, owing to the competition with Russian flax, which was unknown to the Belgian trade in 1841, but in 1846, was imported to the extent of 2,000,000 kilogrammes, (2,000 tons.) Nevertheless, the value of the flax now cultivated, is greater than at any former period, as it is almost all of fine quality.

The Belgian Government in 1841, adopted means for securing flax growers against fraud, in the case of Riga barrels being employed for filling with old or inferior seed, by sealing the full barrels when imported, in such a manner as to prevent them being opened without destroying the seals, and these were made to indicate the year of importation.

Flax, in Belgium, is made ready for the spinner, in bolls of 10½ kilogrammes or 22¾lbs. It is previously made up in stones or bottes, varying in weight in the different districts. The kilogramme equals 2.20486lbs. avoirdupois.

The soil of Belgium is various. Owing to its peculiar nature, the agriculturist has to contend against many difficulties, and consequently to resort to many methods and resources, not much attended to in other countries. Portions of it consist of sand mixed with a very fine clay and organic matter, forming a rich loam. Other portions in a state of nature, were a sandy heath, to convert which,

into a productive soil, is a tedious process. Broom is first sown, followed by buckwheat and potatoes. The successful cultivation of such land, is entirely dependent on frequent supplies of manure in a solid and liquid form, more especially the latter, to the collection of which great attention is paid. The mode of cultivation somewhat resembles that usually given to a garden, the soil in many places being turned over with the spade in a dexterous manner without the application of the foot.

Land intended for flax is turned over with the plough or spade, in the month of October or November. The best is a deep loam, with a clay subsoil. Manure is applied in a liquid state, about three weeks before sowing, and harrowed in. It generally consists of a mixture of cow dung, night soil and rape seed refuse, mixed with urine and water. Land is sometimes ploughed but once in spring. The furrow-slice is generally 3 inches deep, and from 8 to 10 broad. Light harrows with wooden teeth projecting forward at an angle of 60° are used after sowing. The ground is then compressed by the treading of men or women, wearing wooden shoes.

Two systems of preparing flax prevail in Belgium, namely, the blue and the white. The blue system resembles what is called in Ireland, green steeping, the flax being watered in a green state, and brought to market the same year it is grown, deriving its name from the blue color imparted to the fibre, by the stagnant steep water.

The white is the Courtrai system, practiced in West and French Flanders, where running water is abundant.

Value of an acre of flax, in the Blue Districts, the farmer selling the straw to the Factor.

	£	s.	d.	£	s.	d.
One statute acre, Cy	14	12	0			
Seed	2	8	8			
				17	0	8
Expenses.						
Ploughing and sowing	1	4	4			
Seed	1	10	5			
Manure	1	16	6			
Weeding		12	2			
Rent and taxes	2	2	7			
				7	6	0
Farmer's profit				£9	14	8

Value when scutched.

	£	s.	d.	£	s.	d.
7 cwt. of flax, at £4 17s. 4d. per cwt.	34	1	4			
2 cwt. of tow " 12s. 2d. do.	1	4	4			
				35	5	8
Expenses of preparing.						
Cost of one acre	14	12	0			
Pulling	0	17	0			
Rippling	0	18	3			
Steeping and carting	0	19	5			
Spreading	0	18	3			
Turning	0	6	1			
Scutching 7 cwt., at 14s. 7d.	5	2	2			
				23	13	4
Factor's profit				£11	12	4

The instructions given by the Royal Irish Flax Society, for the management of the flax crop, in all its stages, will be found in another page; these embody all the information that it might be desirable to insert here, relative to the preparation of the plant in the Pays de Waes district.

Steep pools are numerous throughout this portion of the country. If not filled when required with water from the natural drainage, a supply is obtained from the Scheldt. Men standing in the water, lay the bundles of flax in the bottom of the pool, somewhat sloping, the tops of one row of beets reaching to the bands of another, covering them as they proceed with earth taken from the bottom of the pit.

The following rotations of crops are practised in the Lokeren and Courtrai districts; first year, potatoes manured; second year, wheat, no manure; third year, flax.

First year, wheat; second year, rape; third year, potatoes; fourth year, rye; fifth year, clover and grass; sixth year, oats; seventh year, flax.

Value of an acre of flax, in the White District-

	£	s.	d.	£	s.	d.
One acre, best quality	24	6	8			
Seed	2	2	7			
				26	9	3
Expenses						
Ploughing and sowing	1	16	6			
Manure	2	8	8			
Seed	2	2	7			
Weeding	0	18	3			
Rent and taxes	2	2	7			
				9	8	7
Farmer's profit				£17	0	8

Value when scutched.

7 cwt. of flax, at £9 14s. 8d. per cwt.	68	2	8			
2 cwt. of tow, at 1 0 0 do	2	8	8			
				70	11	4

Expenses of preparation.

Cost of one acre	24	6	8			
Pulling	0	18	3			
Stooking	0	6	1			
Tying up and stacking	0	18	3			
Seeding	0	9	8			
Steeping and rickling	1	16	6			
Turning	0	6	1			
Tying up and stacking	0	18	3			
Steeping	1	16	6			
Turning	0	6	1			
Tying up and carting	1	16	6			
Scutching 7 cwt., at £1 4s. 4d.	8	10	4			
				42	9	2
Factor's profit				£28	2	2

Steeping flax in running water is peculiar to Courtrai. The mode of saving it for this system will be found in the instructions afterwards given.

Steeping is not generally done in the year in which the flax is grown. After the seed has been removed, it is prepared for watering, by putting two bundles into one, roots and tops alternate, and binding it with three straw bands. These are set on end, in crates made for the purpose, about 12 ft. long, 8 ft. wide, and 3 ft. high; when filled, they are pushed into the river, and covered with boards, on which stones are placed, of a weight sufficient to sink the whole, three or four inches below the surface of the water.

Thus left to float, fermentation soon takes place. When sufficiently steeped, it is taken out, each beet divided into two, and set on foot to dry. When perfectly dry, it is bound and put in stack. The finest flax is generally kept in stack for two or three years, and twice steeped, which greatly improves its quality.

While on the subject of Belgian flax cultivation, it may no be uninteresting to notice a plan by which great value is given to this staple article of trade. Lin Ramé, (or sticked flax,)is treated in the following manner.

Five bushels per acre of the best Riga seed, are sown on land which has been carefully cultivated and enriched for years. The plot is then Ramé, thus:

Forked stakes are driven into the ground, forming squares, poles are laid upon these, at a height of eight inches from the ground, netting is also used, secured in the same manner. The flax, which grows high and slender, is thus supported as it reaches maturity. So soon as the seed begins to form, it is pulled, set on end in circles, and dried without much exposure. Great attention is paid to the processes of watering and scutching. Flax treated in this manner is worth in the green state, from £60 to £70 per acre; and when scutched, from £300 to £350 per ton. Its value is greatly increased when manufactured into the finest Brussels lace.

Cultivation of flax in Ireland.

Two methods at present exist in Ireland for the disposal of flax. It may be sold in the straw, to the retteries, or green steeped by the farmer. By far the greatest quantity is prepared in the latter manner. The profits, per acre, may be thus given in Cy.

A statement showing the expenses of cultivating and preparing for market an Irish acre of flax.

	£	s.	d.	£	s.	d.
Expenses, including rent, seed, labor and taxes	7	6	0			
Scutching 60 stones, at 1s.	3	13	0			
Attendance	0	2	5			
Drawing to mill	0	6	1			
Drawing to market	1	4	4			
				12	11	10
60 stones, at 12s. 2d.				36	10	0
Profit				£23	18	2

The following statements show the profit to the grower, from an Irish, Statute and Cunningham acre of flax, when sold in the straw. The calculations are the results of the experience of farmers, in the localities where the different measures have been commonly used.

Cost of cultivating an Irish acre of Flax

	£	s.	d.
One autumn ploughing	0	12	2
One spring ploughing and grubbing	0	9	0
Once rolling and harrowing	0	9	0
Sowing	0	0	4
Harrowing and rolling	0	3	0
Weeding	0	6	1
Pulling	0	12	2
Stooking	0	3	7
Stacking	0	3	0
Carting to Factory	0	9	8
Rent and taxes	2	8	8
Seed	2	8	8
	8	5	4
3½ tons flax, with seed, at £4 5s. 2d. per ton	14	18	1
Profit	6	12	9

A six or seven-shift course of cropping is considered better than a shorter one, e. g., first year, meadow; second and third years, pasture; fourth year, grain crop; fifth year, green crop manured; sixth year, grain crop; seventh year, flax. It is optional with the farmer to sow the flax on the fourth or seventh year.

A five-shift course is as follows:—First year, oats after pasture; second year, turnips, potatoes, mangolds, beans or flax; third year, wheat, barley or oats, with clover and grass; fourth year, clover and grass; fifth year, pasture.

Cost of cultivating a statute acre of flax, heavy land.

	£	s.	d.
One fall ploughing	0	8	6
Twice harrowing in Spring	0	1	2
Crosskilling	0	1	10
Twice harrowing	0	1	2
Drilling seed	0	1	2
Twice harrowing	0	1	2
Weeding	0	14	7
Pulling and binding	0	12	10
Stooking	0	1	2
Carting to Factory	0	12	2
Seed	1	5	6
Rent and taxes	2	12	0
	6	12	7
Value of flax straw and seed	11	11	2
Profit	£4	18	7

Such a crop of flax would probably be sown on fallow-wheat stubble, which, if sown with beans or peas, would pay the farmer £2 less per acre. These beans or peas, however, would probably be followed by barley, which would yield nine bushels more per acre than it would if following flax.

Cost of cultivating a Cunningham acre of flax.

	£	s.	d.
One ploughing	0	12	2
Three harrowings	0	3	7
Once rolling	0	1	2
Seed	1	9	2
Sowing	0	0	3
Once harrowing	0	1	2
Once rolling	0	1	2
Weeding	0	7	3
Pulling, binding and stooking	0	18	3
Carting	0	6	1
Rent and taxes	2	3	9
	6	4	0
Value of crop	13	19	10
Profit	£ 7	15	10

Steep pools are generally made four feet deep, eight to twelve wide, and of any length. The water is stagnant, and admitted four or five weeks before it is required.

The flax, after rippling, is brought to the pool, in which it is placed in rows, one beet deep, at an angle of 45º , the bands of each succeeding row reaching between the root end and band of the last. Straw is spread over it, on which stones or sods are placed, in order to sink it below the surface of the water. Additional weight is required when fermentation commences, and taken off when it subsides. When sufficiently steeped, it is carted to a smooth pasture, and spread out in rows, evenly and thin. This is called, grassing, and requires from six to ten days.

It is calculated that at least 100,000 acres of flax are steeped in Ireland, without the seed having been taken off, and that the latter, at crushing price, would be worth £365,000.

The foregoing description, has reference to green steeping.

When flax is dried in the straw, and the seed saved, as good a quality of fibre can be produced by steeping, in the following year, as when the plant is steeped green.

The analyses of the flax plant, by Sir R. Kane and Professor Hodges, represent an amount of nutrition in the capsules, of some value for feeding purposes.

The results, by Kane, are tabulated as follows:—

Substances analysed.	Ashes. per cent.	Phosphoric acid. per cent.	Nitrogen. per cent.
Capsules	8.80	0.39	1.80
Husks	6.54	0.38	1.50
Seeds	5.18	0.47	1.81
Cake	8.67	0.81	2.25

"To establish a comparison of the nutritive values of these bodies, it is first necessary to remark, that, according to the analysis of Boussingault, whose correctness is worthy of great confidence, the nitrogen and phosphoric acid of wheat and oats, which we may take as standards, are as follows:—

In 100 parts, wheat contains 2.3 of nitrogen, and 1.13 of phosphoric acid, per cent. Oats contain 2.2 of nitrogen, and 0.60 of phosphoric acid, per cent,

Now, representing the real nutritive powers of these varieties of food, as being the result of the nitrogen and phosphoric acid conjoined, that is, of their product, and assuming the nutritive power of wheat as a standard, 100, we find that we may express the

Nutritive powers of Wheat	100
Oats	51
Flax capsules, with seeds	27
Husks	22
Flaxseed	33
Linseed cake	70
Dry clover hay	39

The precise nutritive value of the different substances, yielded by the flax plant, is thus seen; and it becomes evident that the capsules or husks, may be used as food with very great advantage."

Rippled seed is worth, for crushing, from 4s. 2d. to 5s. 6d. per bushel The quantity of clean seed from an acre averages from twelve to fourteen bushels, and taking 5s. as an average price, should bring £3 to £3 10s. per acre.

Linseed cake is an important adjunct in fattening farm stock, ranging in price from £9 to £12 per ton. A bushel of good flax-seed weighs 54lbs. and will yield 12lbs. of oil, weighing per gallon, 9lbs. 2oz. unboiled, and worth £1 16s. per cwt. An oil mill, with two pair of stones, will crush 100 bushels of seed per day.

Direction for the proper management of flax crop.

(Compiled by the Committee of the Royal Society for the promotion and improvement of the growth of flax in Ireland.)

Soil and rotation.

By attention and careful cultivation, good flax may be grown on various soils, but some are much better adapted for it than others. The best is a sound, dry, deep loam, with a clay subsoil. It is very desirable that the land should be properly drained and subsoiled, as, when it is saturated, with either underground or surface water, good flax cannot be expected.

Without method there cannot be success; different soils require a difference of rotation. In the best soils of Flanders, flax is grown in the third year of a seven-course rotation, or the fifth year of a ten-course rotation.

It is not to be considered generally advisable to grow flax more frequently than once in ten years; not because it exhausts the land more than any other crops, but because good flax cannot be had at short intervals, on the same soil. In Belgium, it invariably follows a corn crop, generally oats; and in this country, where oats is such a usual crop, the same system might be profitably pursued, but it must be understood, that it is only after oats following a green crop, or old lea, and never after two or three succeeding crops of oats. It is a very general error among farmers to consider it necessary that flax should follow a potatoe crop. Except on very poor soils, a better crop will be produced after grain, and the double profit of the grain and flax secured. If old lea be broken up, and potatoes planted, followed by a grain crop, a very fine crop of flax may be obtained in the ensuing year.

Preparation of the soil.

One of the points of the greatest importance in the culture of flax, is by thorough draining, and by careful and repeated cleansing of the land, from weeds, to place it in the finest, deepest and cleanest state. This will make room for the roots to penetrate, which they will often do, to a depth equal to one half the length of the stem above ground.

After wheat, one ploughing may be sufficient, on light friable loam, but two are better; and on stiff soils, three are advisable. Much will, of course, depend on the nature of the soil, and the knowledge and experience of the farmer.

Sowing.

The best seed adapted for the generality of soils is Riga. In buying seed, select it plump, shining and heavy, and of the best brands, from a respectable merchant. Sift it clear of all the seeds of weeds, which will save a great deal of after trouble, when the crop is growing. The proportion of seed may be stated at three and a half imperial bushels to the Irish acre, and so in proportion to the English or Statute acre. It is better to sow too thick, than too thin, as, with thick sowing, the stem grows tall and straight, with only one or two seed capsules at the top; and the fibre is found greatly superior, in fineness and length, to that produced from thin sown flax, which grows coarse, and branches out, producing much seed, but a very inferior quality of fibre. The sowing of clover and grass seeds along with the flax is not advised where it can be conveniently avoided, as these plants always injure the root end of the flax. But carrots may be sown, in suitable soils, in drills, so that the person pulling the flax, may step over the rows, which may be afterwards hoed and cleaned, and should have some liquid manure. Rolling the ground after sowing, is very advisable, care being taken not to roll when the ground is so wet that the earth adheres to the roller.

Manure for the Flax Crop.

Recent chemical investigations have shewn that the fibre of Flax does abstract from the soil certain matters, although not in so large a proportion as several other commonly cultivated crops. To supply to the soil all the matters which the entire plant requires, so as to leave the land in the same state of fertility as before, the following compound has been proposed, by Professor Hodges, as a manure, which may be sown broadcast on the land, prior to the last harrowing before sowing the Flax-seed :—

For a statute acre of land.

	s.	d.
Muriate of Potash, 30 lbs	3	7
Chloride of Sodium (common salt), 28 lbs	0	4
Burned Gypsum, powdered, 34 lbs	0	7½
Bone dust, 54 lbs	4	0
Sulphate of magnesia (Epsom Salts), 56 lbs	4	10
Cost about	13	4½

Weeding.

If care has been paid to clearing the seed and the soil, few weeds will appear; but if there be any, they must be carefully pulled. It is done in Belgium by women and children, who with coarse cloths round their knees, creep along on all-fours. They should work, also, facing the wind, so that the plants laid flat by the pressure may be blown up again, or thus be assisted to regain their upright position.

Pulling.

The time when Flax should be pulled is a point of much nicety to determine. The fibre is in the best state before the seed is quite ripe. If pulled too soon, although the fibre is fine, the great waste in scutching and hackling renders it unprofitable ; and if pulled too late, the additional weight does not compensate for the coarseness of the fibre. It may be stated, that the best time for pulling is, when the seeds are beginning to change from a green to a pale brown color, and the stalk to become yellow, for about two-thirds of its height from the ground. When any of the crop is lying, and suffering from wet, it should be pulled as soon as possible, and kept by itself. So long as the ground is undrained, and imperfectly levelled before sowing, the Flax will be found of different lengths. In such cases pull each length separately, and steep in separate pools, or keep it separate in the same pool. Where there is much second growth, the Flax should be caught by the puller just underneath the bolls, which will leave the short stalks behind. If the latter be few it is best not to pull them at all. If the ground has been drained, and laid out evenly, the Flax will be all of the same length. It is most essential to take time and care to keep the Flax even, like a brush, at the root ends. This increases the value to the spinner, and, of course, to the grower, who will be amply repaid, by an additional price, for his extra trouble. Let the handfuls of pulled Flax be laid across each other diagonally, to be ready for the

Rippling,

Which should be carried on at the same time, and in the same field, with the pulling. If the only advantage to be derived from rippling was the comparative ease with which rippled Flax is handled, the practice ought always to be adopted; but, besides this, the seed is a most valuable part of the crop, being worth, if sold for the oil mill, £3 per acre, and if used for feeding stock of all kinds, at least £4 per acre. The ripple consists of a row of iron teeth screwed into a block of wood. The best are made of half-inch square rods of iron, placed with the angles of iron next the ripplers, 3-16th of an inch asunder at the bottom, half an inch at the top, and 18 inches long, to allow a sufficient spring, and save much breaking of Flax. The points should begin to taper 3 inches from the top. It is to be taken to the field, where the Flax is being pulled, and screwed down to the centre of a nine-feet plank, resting on two stools. The ripplers may either stand or sit astride at opposite ends. A winnowing sheet must be placed under them, to receive the bolls as they are rippled off ; the Flax can often be rippled without being passed more than once through the comb. The rippler lays the handfuls down at his left side, each handful crossing the other, when the sheaf shall be carefully tied up and removed. If the weather be dry, the bolls should be kept in the field, spread on winnow cloths, or other contrivance for drying ; and, if turned from time to time, they will win. If the weather be moist, they should be taken in doors, and spread out thinly and evenly on a barn floor, leaving windows and doors open, and turned twice a day. When nearly dry, they may be taken to a corn-kiln (taking care not to raise it above Summer heat), and carefully turned, until no moisture remains. The heaviest and plumpest seed should be used for sowing or crushing, the light seeds and chaff form most wholesome and nutritious feeding for cattle. Flax ought not to be allowed to stand in the field, if possible, even the second day ; it should be rippled as soon as pulled, and carried to the water as soon as possible, that it may not harden. This chapter on rippling has reference to green-steeping only.

Watering.

This process requires the greatest care and attention. River water is the best, if spring water has to be used, let the pond be filled some weeks or months, before the Flax is put in, that the sun and air may soften the water. That containing

iron or other mineral substances should never be used. The best size of a steep-pool, and the method of filling, have been given in a previous page. A small stream of water, allowed to run through a pool has been found to improve the color of the Flax. In this case, if the pools are in a line, the stream should be conducted along the one side, and run into each pool separately, and the water of each pool run off, along the opposite side, in a similar manner. It will be sufficiently steeped, in an average time, from eight to fourteen days, according to the heat of the weather and the nature of the water. The best test is the following:—Try some stalks, of average thickness, by breaking the *shove*, or woody part, in two places, about six or eight inches apart, at the middle of the stalk ; catch the broken bit of wood, and if it *will pull freely out, downwards, for that length, without breaking or tearing the fibre, and with none of the fibre adhearing to it*, it is ready to take out. Make this trial every six hours, after fermentation subsides, for sometimes the change is rapid. It is advantageous to let the Flax drain twelve to twenty-four hours, after being taken from the pool, by placing the bundles on their root ends.

Spreading.

Select, when possible, clean, short, thick pasture ground for this operation ; or a newly mown meadow, lay the Flax evenly on the grass, and spread thin and very equally. If the directions under the head of rippling have been attended to, the handful will come readily asunder, without entangling.

Lifting.

Six or eight days, if the weather be showery, or ten to twelve if it be dry, should be sufficient on the grass. A good test of its being ready to lift is, to rub a few stalks from the top to the bottom ; and, when the wood breaks easily, and separates from the fibre, leaving it sound, it has had enough of the grass. Also, when a large proportion of the stalks are preceived to form a *bow and string*, from the fibre contracting, and separating from the woody stalk. But, the most certain way, is to prove a small quantity with the hand-break or in a Flax-mill. It will be much improved by being put up in small stacks, loosely built, and set on pillars to allow free circulation of air.

The Courtrai System.

This is the mode in which Flax should be saved for steeping on Schenck's or Watt's patent systems. The Flax stems should be put together in bunches, about one-half larger than a man can grasp in one hand, spread a little, and laid on the ground in rows after each puller ; the bunches laid with tops and roots alternately. The stooking should go on at the same time as the pulling. The handfuls, as pulled, are set up, resting against each other, the root ends spread well out, and the tops joining like the lettter A. The stooks are made eight to ten feet long, and a short strap keeps the ends firm. In six or eight days, the Flax should be ready for tying up in sheaves of the size of corn sheaves. It is then ricked, and allowed to stand in the field until the seed is dry enough for stacking. To build the rick, lay two poles parralel on the ground, about a foot asunder, with a strong upright pole at each end. The Flax is then built, the length of a sheaf in thickness. The bottom poles should be laid north and south, so that the sun shall get at both sides of the rick during the day. In building, the sheaves should be laid tops and roots alternately, built seven to eight feet high, and finished on the top, by laying a single row of sheaves lengthwise, or across the others, and then another row as before, but with the tops all the same way, which gives a slope to throw off rain ; straw is put on the top, and tied with a rope. It can be stacked at leisure, or put in a barn, the seed taken off during the winter, and the Flax steeped in the following

May or June; or it may be kept stacked, without receiving any injury, for two or three years, or even longer.

Retteries, in Great Britain and Ireland, purchase both straw and seed from the Farmer.

Schenck's Patent System.

In 1847, Mr. Schenck brought before the notice of the Royal Irish Flax Society, his method of hot water steeping. After minute examination its general adoption was recommended, especially in districts where the cultivation of Flax was being introduced, so as to afford the farmer a ready market for his raw produce, and thereby obviate the necessity of subjecting him to the operations of steeping and scutching.

We find it stated in the last annual Report of the Flax Society, that eighteen establishments on this system were at work in Ireland. Similar establishments are also at work in England, Scotland, Germany, and France.

Hitherto, the quality of the fibre produced in the Irish retteries has been inferior. A different result is presented in English and Scotch Factories.

Since the introduction of Watt's system, a new aspect has been given to the method of Schenck, by borrowing from the former a main feature of his Patent, viz : passing the Flax straw in a wet state between heavy rollers, after undergoing the accelerated fermentation.

The principal of Schenck's system is still regarded as sound, though the quality of the fibre produced will necessarily be various, according to the details of the operations in any individual rettery.

The profits of those who cemmercially engage in it, as stated in the Report alluded to, must depend upon the price they pay for the straw, their skill in putting a right value on its various qualities, the state in which it is furnished by the growers, the care and skill devoted to the details of working, and the economy of labor throughout.

Messrs. Bernard and Koch, the present Patentees of Schenck's system, have furnished the following information, which may be useful to parties, desirous of entering this new branch of business.

It must be ascertained whether the general character of the land in the neighborhood of the intended rettery is suitable for the growth of Flax ?

Whether a sufficient quantity is likely to be grown in the immediate neighborhood, say 10 miles round.

The quality of the water, and if a constant supply for the retting process can be had during the whole year ? Soft water is the best ; hard water must be avoided.

In the selection of a site for a rettery, the following requisites must be kept in view.

An open space of several acres, according to the proposed size of the establishment, accessible by good roads, aud unsheltered by hills or plantations, to insure quick drying.

A fall of water by which pumping is avoided.

A good outlet for the waste steep water.

The vicinity of a population, from which a sufficient number of hands can be obtained.

The following is an estimate for a rettery calculated to manufacture the produce of 300 acres, the buildings of the best construction, and the prices reduced to currency.

Plant.

	£	s.	d.
6 vats with steam pipes and all appendages	250	0	0
5,000 drying rods and rings	60	0	0
Seeding machine	18	0	0
Sifting machine and fanners	20	0	0
Wet rollers	36	0	0
Desiccating apparatus	70	0	0
Weigh bridge	20	0	0
Sundry implements, tables, &c	20	0	0
Twelve-horse boiler and eight-horse high pressure steam engine	190	0	0
Shafting	18	0	0
Scutching machinery	180	0	0
	£882	0	0

Buildings.

Seeding house, 2 stories 80 x 25 feet, walls 20 feet high, slated roof, ground floor asphalted	360	0	0
Vat house and spreading room 80 x 36 feet, walls 10 feet high, spreading room floor, asphalted	160	0	0
Scutching mill 45 x 25 feet, wall 11 feet high, asphalted floor	120	0	0
Engine house and chimney	80	0	0
Desiccating house 20 x 20 feet, plastered and ceiled, fire proof roof	70	0	0
Store room 60 x 16	60	0	0
	£850	0	0

Buildings adopted to all the pnrposes required can be constructed in this country, at a cost much below the foregoing estimate.

Where water power is abundant, a steam-engine and chimney will not be required.

Hands employed.

	Men.	Boys or Girls.
General work	1 manager	0
"	1 day foreman	0
"	1 night do	0
"	1 watchman	0
"	1 man	2
Seeding	1 man	7
Retting, rolling and drying	1 man	14
Scutching by machine	1 man	4
Sorting	1 maker up	0
Total	9	27

Professor Hodges, from an examination of the books of the Patent-Steep-Works at Cregagh, in Ireland, gives the following average statement of the changes which 108 tons of Flax undergo, when treated by Schenck's process.

100 tons of air-dried Flax straw yield :—

	Tons.
1st *By seeding*, 33 tons of seed and husks, leaving of seeded Flax...	67
2nd *By steeping*, 67 tons of seeded Flax, yield of steeped straw....	39.5
3rd *By scutching*, 39½ tons of steeped straw, yield of dressed Flax..	5.60
Of tow and pluckings.....	1.47

"The very small produce of fibre obtained at Cregagh," says the Professor, "shows, that as conducted at that establishment, it would be impossible to carry on the hot water steeping with profit to the manufacturer," but adds, "We are inclined to believe, that in many cases, the failure of the steeping works must be ascribed to carelessness, and absence of proper management."

By the kindnes and liberality of Mr. John C. Wilson, the talented superintendent of Mr. Fergus's Flax Factory in Scotland, I am enabled to give some tabular results, which serve to corroborate these last remarks, I had an opportunity of witnessing the several operations the results of which are here noted.

The books of the establishment show by the following figures, that Flax can be prepared with profit by Schenck's system.

100 tons of air dried Flax straw yield :—

	Tons.
1st. *By seeding*, 30 tons of seed and husks, leaving of seeded Flax..	70
2nd. *By steeping and drying*, 70 tons of seeded Flax, yield of dry straw.	49.8
3rd. *By scutching*, 49.8 tons of dried straw yield of dressed Flax....	9
Of tow and pluckings.....	3

Annexed is the loss in seeding by quantity of different samples of Flax straw.

Undressed Flax.

Tons.	cwts.	qrs.	yield of	Bush. light seed.	Bush. heavy seed.	Bush. chaff.
30	6	3		6½	166	578
20	5	0		12	69	480
22	12	2		11½	157	540
19	14	3		10	152	510
7	2	2		2	43	158
100	1	2		42	587	2266

The following tabular statements show the method of keeping the steeping and scutching books, and the balance sheet of any particular kind of Flax straw.

Exhibit of a quantity of Flax Straw at the Bedford Flax Factory, showing the method of steeping.

No.	Weight—Cwts.	Description.	Quality.	Growth.	Stock.	Steam put on.		Observations.	Water let off.		Steeping Hours.
						Date.	Hour.		Date.	Hour.	
10 11	23	"	1st	1852.		April 1	6 a. m.	Steam rolled.	April 4	8 a. m.	74
" 1	27	"	"	"		" 2	" "	"	" 5	6 a. m.	72
" 2	27	"	"	"		" "	" "	"	" "	" "	72
" 3	27	"	"	"		" 3	" "	"	" 6	8 a. m.	74
" 4	27	"	"	"		" "	" "	"	" "	" "	74
11 5	27	"	"	"		" 4	" "	"	" 7	6 a. m.	72
" 6	27	"	"	"		" "	" "	"	" "	" "	72
" 7	26½	"	"	"		" 5	" "	"	" 8	7 a. m.	73
" 8	26½	"	"	"		" "	" "	"	" "	" "	73
12 1	26½	"	"	"		" 8	" "	"	" 11	6 a. m.	72
" 2	26½	"	"	"		" "	" "	"	" "	" "	72
" 3	26½	"	"	"		" 9	" "	"	" 12	" "	72
" 4	26½	"	"	"		" "	" "	"	" "	" "	72
13 5	26½	"	"	"		" 10	" "	"	" 13	" "	72
" 6	26½	"	"	"		" "	" "	"	" "	" "	72
" 7	26	"	"	"		" 11	" "	"	" 14	" "	72
" 8	26	"	"	"		" "	" "	"	" "	" "	72
14 9	17½	Drawings.	"	"		" 12	" "	"	" 15	" "	72
" 10	20	"	"	"		" "	" "	"	" "	" "	72

Account of Scutching the foregoing.—Stg.

Date. 1853.	Description. Mark.	Name.	Stock.	Vat. No.	Straw. Lbs.	Flax. Lbs.	Codilla. Lbs.	Flax. Per Cent.	Tow. Per Cent.	Time. Sorting.	Breaking.	Scutching.	Shaking Tow.	Cost of Sorting. £ s. d.	Cost of Breaking. £ s. d.	Cost of Scutching. £ s. d.	Cost of Shaking Tow. £ s. d.	Total Cost. £ s. d.	Cost per Ton. Sorting.	Breaking.	Scutching.	Shaking Tow.	Total.	Time per Ton. Breaking.	Scutching.	Shaking Tow.
April 11...	[B]	. . .	. .	10	3864	75	18	. .	. .	. .	1	1	5	0 7 4	0 0 8	0 2 4	0 0 0									
" 12...	. .	. . .	. .	10	4952	482	206	. .	. .	10½	10½	10½	5	0 7 4	0 7 3	1 3 4	0 0 11									
" 13...	. .	. . .	. .	10	2242	438	386	. .	. .	10½	10½	10½	5	0 7 4	0 7 3	1 3 4	0 0 11									
" 14...	. .	. . .	. .	11	5702	393	201	. .	. .	10½	10½	10½	5	0 7 4	0 7 3	1 3 4	0 0 11									
" 15...	. .	. . .	. .	11	980	416	200	. .	. .	10½	10¼	10½	5	0 5 7	0 8 11	1 5 0	0 0 10									
" 16...	. .	. . .	. .	11	. .	266	150	. .	. .	7½	7½	7½	5	0 7 4	0 6 3	1 5 0	0 0 11	9 19 4								
" 18...	. .	. . .	. .	12	5001	377	224	. .	. .	10½	10½	10½	5	0 7 4	0 8 11	1 13 4	0 0 10	2 10 5								
" 19...	. .	. . .	. .	12	. .	502	230	. .	. .	10½	10½	10½	5	0 7 4	0 8 11	1 13 4	0 0 11	2 10 6								
" 20...	. .	. . .	. .	. .	. .	552	218	. .	.	10½	10½	10½	5	0 7 4	0 8 11	1 10 8	0 0 11	2 8 10								
" 21...	. .	. . .	. .	. .	. .	601	200	. .	. .	10½	10½	10½	5	0 6 5	0 8 11	1 13 4	0 0 11	2 10 6								
" 22...	. .	. . .	. .	. .	. .	70	65	. .	. .	9	1	1	5	0 0 0	0 5	0 3 4	0 0 11	0 18 8								
					22741	4172	2098	18.3	9.2	100½	93½	93½	50	3 10 8	4 1 3	12 17 4	0 9 0	20 18 3								
																		£ s. d.								
May 12 ...	. .	. . .	. .	10	6632	432	396	. .	. .	3	7½	7½	4	0 2 9	0 7 11	1 9 11	0 1 3	2 1 10	37s. 11d.	43s. 7d.	138s. 2d.	4s. 10d.	11 4 6	50	50	26
" 13 ...	. .	. . .	. .	11	3414	729	359	. .	. .	10½	10½	10½	5½	0 9 9	0 10 9	2 0 7	0 1 9	3 2 10								
" 14 ...	. .	. . .	. .	11	5953	478	282	. .	. .	7½	7½	7½	5½	0 6 11	0 7 6	1 9 0	0 1 9	2 5 2								
" 16 ...	. .	. . .	. .	. .	. .	497	462	. .	. .	10½	10½	10½	5½	0 9 9	0 10 9	2 0 7	0 1 9	3 2 10								
" 17 ...	. .	. . .	. .	. .	. .	538	361	. .	. .	10½	10½	10½	4	0 9 9	0 10 9	2 0 7	0 1 3	3 2 4								
" 18 ...	. .	. . .	. .	. .	. .	154	308	. .	. .	10½	4	4	6	0 9 9	0 3 9	0 15 1	0 1 9	1 10 4								
					15999	2828	2168	17.6	13.5	52½	50¾	50¾	30½	2 8 8	2 11 5	9 15 9	0 9 6	15 15 4	38s. 7d.	40s. 8d.	155s. 9d.	6s. 10d.	12 1 10	40	40	24

Balance Sheet of same.—Stg.

	£	s.	d.		£	s.	d.
Flax Straw, Tons 32.19.1 at £4 3s. 9d. per Ton	138	0	0	Flax, 1st quality, Tons 2 4.1.18	177	12	10
Cost of Stacking at 1s. 1½d. per Ton	1	17	1	Flax, 2nd quality, Tons 0.18.0.10	45	4	5
Cost of bringing down, Tons 31.16.2 at 5½d. per Ton	0	14	7	Tow, Tons 1.18.0.10, at 5s. per cent.	9	10	5
Loss per cent. in stackyard, 3.4.				Flax Seed, 152 bushels at 5s. per bushel	38	0	0
Flax Straw into Seeding-house, Tons 31.16.2.				Chaff, 510 bushels at 1d. per bushel	2	2	6
Produce of seeded Straw, Tons 22.9.0.				Flax, 1st quality sold at £80 per ton			
Cost of seeding at 3s. 1d. per Ton	4	18	2	Flax, 2nd quality sold at £50 per Ton			
Cost of Stacking at 1s. 2d. per Ton	1	6	3				
Loss in seeding per cent., 29.5.							
Seeded Straw to vats, Tons 22.9.0.							
Produce of dry retted Straw, Tons 17.5.3.16.							
Cost of retting at 7s. 5d. per ton of Straw	8	6	6				
Loss in retting per cent., 29.9.							
Cost of stacking at 8½d. per Ton	0	12	2				
Retted Straw to scutch mill, Tons 17.5.3.16.							
Produce of Flax, Tons 3.2 2.							
Produce of Tow, Tons 1 18.0.10.							
Cost of Scutching, Sorting, and Shaking Tow at £11 11s. 6d. per Ton.	36	3	7				
Proprietors' Interest and Ledger Accounts—at £10 per Ton of dressed Flax	31	5	0				
Profit	49	6	10				
£	272	10	2	£	272	10	2

Watt's Patent System.

Among the many new plans brought forward for the preparation of Flax from the straw, the most prominent is that of Mr. Watt.

Since its first introduction it has made rapid progress, though its merits have not yet been sufficiently tested.

The maceration of the Flax straw is effected by the agency of steam, which disunites its cementing materials.

Dispensing with fermentation, it also differs from Schenck's patent in the point of time. By steeping at a temperature of 90 °, seventy hours were required by the fermenting process. The introduction of wet-rolling has reduced this period to fifty. In Watt's process the time is further reduced to twenty-six hours.

It will be seen from the Report of the Irish Flax Society quoted below, that the time occupied in the experiment superintended by their Committee, was about eleven hours. Since then, some alterations have been made in the manufacturing process, which lengthen the period in every-day practice.

The following Report of the Committee appointed to institute an experimental trial on Mr. Watt's system of preparing Flax fibre from the straw is highly favorable.

"Mr. Watt's system may be briefly described as follows :—The Flax straw is delivered at the works by the grower, in a dry state, with the seed on. The seed is separated by metal rollers, and afterwards cleaned by fanners. The straw is then placed in close chambers, with the exception of two doors, which serve the purpose of putting in and discharging the straw ; the top, which is of cast iron, serve the double purpose of a top and condenser. The straw is then laid on a perforated false bottom of iron, and the doors being closed and made tight by means of screws, steam is driven in by a pipe round the chamber and between the bottom, and penetrating the mass, at first removes certain volatile oils contained in the plant, and then is condensed on the bottom of the iron tank, descending in a continuous shower of condensed water, saturating the straw, and forming, in fact, a decoction of the extractive matters which connect the fibrous and non-fibrous portions of the plant. This liquid is drawn off ftom time to time, and the more concentrated portions are used for feeding ; the process is shortened by using a pump, or such anangement as will repeatedly wash the mass, with the water allowed to accumulate. In about 8 to 12 hours, varying with the nature of the straw, it is removed from the chambers, and having been robbed of its extractive matter without decomposition, it is then passed through rollers for the purpose of removing the epidermis, or outer skin of the plant, of discharging the greater part of the water, contained in the saturated straw, and, while in the wet and swollen state, splitting it up longitudinally. The straw being free of all products of decomposition, is then easily dried, and is in a few hours ready for scutching.

In the experimental trial, personally superintended, throughout all the details, by the Committee, a quantity of Flax straw, of ordinary quality, was taken from the bulk of the stock at the works, weighing 13¾ cwts. with the seed on. After the removal of the seed, which, on being cleaned thoroughly from the chaff, measured 3¾ imperial bushels, the straw was reduced in weight to 10 cwt. 1 qr. 21 lbs. It was then placed in the vat, where it was subjected to the steaming processes, for about eleven hours. After steeping, wet rolling, and drying, it weighed 7 cwt. 0 qrs. 11 lbs ; and on being scutched, the yield was 187 lbs. of Flax ; and of scutching tow, 12 lbs. 6½ oz. fine, and 35 lbs. 3 oz. coarse. The yield of fibre, in the state of good Flax, was, therefore, at the rate of 13½ lbs. from the cwt. of straw with seed on ; 18 lbs from the cwt. of straw without seed ; 26¼ lbs. from the cwt. of steeped and dried straw.

The time occupied in actual labor in the processes, from the seeding of the Flax, to the commencement of the scutching was 13¼ hours, to which if 11 hours be added for the time the Flax was in the vat, 24¼ hours, would be the time required up to this point. The scutching by four stands occupied six hours, sixteen minutes. But in this statement, the time required for drying is not included, as, owing to some derangement in the apparatus, no certain estimate could be made of the actual time required in that process. It would appear, however, that about thirty-six hours would include the time necessary, in a well organised establishment, to convert flax straw into fibre for the spinner.

The cost of all these operations, in the experiment, leaving out the drying, for the reasons noted, appeared to be under £10 per ton of clean fibre, for labor, exclusive of general expenses.

A portion of the fibre was sent to two spinning-mills to be hackled, and to have a value put upon it. The valuation of the samples varied from £56 to £70 per ton, according to the quality of the stricks of fibre sent, and the yield on the hackle was considered quite satisfactory.

On the results of this experiment, which was necessarily of a limited nature, the Committee think it best to offer no general remarks. They are sufficiently favorable to speak for themselves. It remains to be ascertained whether the qualities of Flax fibre, prepared by this method, are such as to suit the the spinner and manufacturer. They have been informed by a spinner who has been trying some Flax prepared by Mr, Watt's system, that the yarn made from it appears equal in all respects to what is ordinarily spun from good Irish Flax, of the finer sorts.

The Committee conceive that the most prominent and novel feature of this plan consists in the substitution of maceration, or softening, for fermentation. In the steeping of Flax, both in cold and hot water, the fibre is freed from the substance termed gum, by the decomposition of the latter; while in Watt's system, the maceratiou of the steam loosens the cuticle and gum, which are further separated mechanically, in the crushing operation, and, after the drying of the straw, readily part with the wood, under the action of the scutch-mill. Before concluding this statement, the Committee wish to call attention to a very curious feature in Mr. Watt's invention. The water from the vats, in place of being offensive and noxious, as is the case with ordinary steep water, contains a certain amount of nutritive matter. This arises from its being an infusion of the Flax stems, in place of holding in suspension or solution the products of the decompositon of the gum, and other substances contained in the stems. The inventor is now employing this water, along with the chaff of the seed-bolls, for feeding pigs, it is of much interest therefore, to note in how far this may be found practically to answer, as, between the seed, the chaff and the water, by far the greatest portion of what the Flax plant abstracts from the soil would thus be returned in the shape of manure. However this may turn out, the avoidance of all nuisance in smell, and of the poisonous liquid which causes some damage among fish when let off into rivers, is a matter of some consequence.

It is to be hoped that so promising a plan may, on more extended experience be found fully to warrant the high anticipations formed from what is already known coucerning it.

Signed on behalf of the Committee,

RICHARD NIVEN,
Chairman.

Note of the time occupied, and of the number of persons employed in each of the processes witnessed by the Committee, on the experimental trial of Mr. Watt's system of preparing Flax:—

	Number of persons employed.		Time occupied.	
	Men.	Women and Boys.	Hours.	Minutes.
Seeding	4	8	1	15
Placing in vat	3	4	0	15
Cleaning seed	1	0	3	0
Taking out of vat	2	3	0	30
Wet-rolling and putting in drying-room	1	16	2	20
Rolling for scutching	0	11	1	8
Stricking for do	0	7	4	47
	11	49	13	15
Scutching	4	0	6	16

The yield of fibre from the dried straw will be found from the foregoing figures to be 23.5 per cent.

By the kindness of the patentee, I was enabled to undertake several experiments, the results of which also shew a very high yield. It will be observed that the process of preparation now in use, is somewhat different from that described in the Committee's report.

A beet of Flax Straw, weighihg 7½ lbs., with a distinctive mark, was placed in the centre of the steam chamber. After the doors were closed, a mixture of equal parts of the old steep liquor and pure water, was pumped from the reservoir into the hot water cistern which stands in the condenser, on the steam chamber's top. A jet in the interior of the chamber, connects with the hot-water cistern, by which means the chamber was nearly three-fourths filled with this compound. Steam was admitted simultaneously with the water. The time occupied in steaming was 25 hours. The Flax was taken out of the chamber, wet rolled, and dried in the open air, weight after drying 6 lbs. It was then broken, stricked, and scutched, weight after scutching, 1 lb. 5 oz. yield of fibre 22 per cent.

The following estimate of plant for Watt's patent system, is furnished by A. & W. Smith & Co., Paisley.

	£.	s.	d.
2 Chambers for steaming, cy	182	10	0
2 Wet rolling machines	92	9	4
Apparatus for drying Stove	85	3	4
Flax breaking machine and scutch-mill with 8 stands	109	10	0
Seeding-house machinery, viz., seeding rollers, buffing machine, riddle, elevators, and fans	59	12	4
	£529	5	0

These are exclusive of power, shafting, boilers, and buildings.

The drying stove is required in wet weather only. The scutching machinery is on the old principle, not a bad one, but requiring skilled labor.

Claussen's Flax Process.

The specification of the Chevalier Claussen's patent, was enrolled in February, 1851.

His invention naturally excited much attention throughout Europe, but more especially in Great Britain, where it caused much discussion of a controversial

character. It was considered by some that that country was to be rendered nearly independent of foreign supplies of cotton; by others that the conversion of Flax into cotton, was a change as absurd, as the transmutation of gold into brass; while a third party remarked, that were the system to become general, the demand for Flax thence resulting would necessarily advance the already high price of that article, and in the same proportion cotton, being less in demand, would fall; so that at the very outset the substitution would checkmate itself, and consequently cease.

It is immaterial at present, whether it was Des Charmes, or Lady Moira, or Mr. Claussen, that first invented the cottonising process. Its importance in a commercial point of view has been but lately recognized, and recognised by some only when confined to the conversion of Flax tow into factitious Flax-wool.

Data. from which the cost of production of Flax-Cotton, or Wool may be obtained, is difficult of access. Mr. Claussen informs us, that practical experience enables him to say that Flax may be so prepared for 3d. and even as low as 2¼. per lb.

The following is his estimate :—

	£.	s.	d.
6 tons of Flax in the straw, at £3 per ton or.....			
2 tons of Flax partially cleaned by the grower, at say £9 sterling per ton.....	18	0	0
Ingredients employed.....	5	0	0
Cost of labor.....	6	0	0
	£29	0	0

Being about 3d. per pound.

Sixpence sterling per pound, for Flax-Cotton or Wool in the market, may be regarded as the lowest paying price.

A commission under Lord Clarendon's Administration in Ireland was appointed to inquire into the nature and condition of the processes lately proposed by Mr. Claussen and others, for improvement in the preparation and uses of Flax fibre. The direction of the inquiry was committed to Sir Robert Kane, who chose for his associates Professors Hodges, Murphy, and Blyth.

The investigations were conducted at Mr. Dargan's works, Kildinan County Cork.

The following letter is an extract from the Report of progress of Sir R. Kane to the Right Honorable the Chief Commissioner of Works, ordered by the House of Commons to be printed, 2nd May, 1852.

Cork, 7th October, 1851.

Sir,—In compliance with your instructions, we proceeded to Kildinan on 23rd September, when informed by Mr. Graves, Superintendent of Chevalier Claussen's process, that his arrangements were made for commencing this process. We intended in the first instance to direct our attention entirely to this method of preparing long fibre, and the so-called Flax-cotton. We communicated to Mr. Graves that your instructions directed the experiments to be conducted on so large a scale as to furnish data for calculating the Commercial value of the process, when informed by him, after the experiments had commenced, that the means at his disposal at Kildinan were insufficient for this purpose.

We regret that before submitting his process to a trial on a large scale, for the express purpose of testing its Commercial value, the Superintendent had not first made every mechanical and chemical preparation which he considered absolutely necessary for such a purpose, or declined commencing his experiments until such arrangements had been made as he alone was capable of judging to be requisite.

Under these circumstances, therefore, we have no official report, in accordance with your instructions to present to you.

We think it necessary, however, to mention that in our presence two small experiments were made, to convert into flax-cotton 100 lbs. of broken Flax straw, and 40 lbs. of long tow, both cut into lengths of 1½ inches.

As these can be regarded only in the light of preliminary experiments, and were on much too small a scale to furnish data for any calculation, we do not consider it necessary to enter into the details of the operations. The experiment with the Flax Straw was not brought to a conclusion, the attention of the Superintendant having been ultimately directed solely to the production of Flax-cotton from the tow. A specimen of this product we beg now to enclose you. Its great inferiority to cotton willl be at once apparent to you. In some measure to account for its matted state, and the presence of a considerable quantity of shoves, although passed through a devil, a blower, and a carding machine, we must in justice to the experimenter state, that the devil was rudely constructed, on the spot, by the engineer, and the different apparatus were in bad working order, from the wetness of the weather, and the dampness of the room in which they were placed.

We beg to draw your attention to the appearance under the microscope of the enclosed specimen. A very large proportion of fibre, is found to be still intact, or only very partially divided. The same defect was observed by us in some Flax-cotton, exhibited in Dublin, and obtained from Mr. Graves himself, but in the latter case the proportion of fibre divided is greater than in the specimen from the tow.

The possibility of so completely splitting and preparing by this process Flax-cotton on a large scale so as to render the product as uniform in its appearance and structure as cotton, for which it may be substituted, in the production of the different qualities of thread of a uniform calibre, is not proved by the specimens we have examined.

As at present we have no data whatsoever from which to calculate the cost of production nor the value of the material which may possibly be produced under circumstances favorable to its manufacture, we think it highly desirable that further experiments on a large scale should be made after the Superintendent shall have first maturely considered and provided all the mechanical and chemical appliances which he believes to be essentially necessary to the successful performance of his process.

We are, &c.,

(Signed,) EDWARD MURPHY, A. B
Professor of Agriculture, Queen's College, Cork.

J. BLYTH, M. D.
Professor of Chemistry, Queen's College, Cork.

JOHN F. HODGES, M. D.
Professor of Agriculture, Queen's College, Belfast.

Sir Robert Kane,
Director of the Museum of Irish Industry.

The result of the numerous experiments undertaken by the different individuals interested in cottonising Flax, seems to point to the abandonment of long Flax fibre for that object, and the direction of their manufacturing operations to the preparation of an article from Flax tow suitable to the demands of the Cotton or Woollen trade; or the confinement of their attention more particularly to the conversion of the tow of Flax into factitious Flax-wool, capable of admixture with wool and possessing milling and felting properties.

Flax tow can be had in large quantities, from £5 to £7 sterling per ton.

Whether Claussen's process will come to the aid of the paper manufactures in preparing such tow for the pulp machine, is yet undecided.

A factory for cottonising Flax is in operation near London.

That a company is willing to invest money in erecting a work, filling it with machinery, and paying scientific men for its superintendence, is evidence of confidence in the sucess of its experiments.

The Linen trade, like that of Cotton, is of vast importance. We have seen the spinning frame substituted for the wheel, and the weaver supplanted by the power-loom.

It would be an interesting task to trace the history of the manufacture, and note the successive steps by which it has advanced. Considered to be the staple manufacture of Ireland, Parliamentary aid has been more than causually bestowed.

An Act was passed in the year 1699, for the regulation of the Linen maufacture, providing for the appointment of a Board in Ireland, to be called the Trustees of the Linen and Hempen manufatures, to encourage in every way the culture and proper manipulation of the Flax plant, and to regulate and improve its manfacture into Linens. This Board existed until the year 1828. The chief means which they adopted in furtherance of the views with which they had been appointed, were—the importation of the best Russian and Dutch Flax seed—the distribution of the most approved implements—the location of competent persons to superintend the management of the Flax—the supervision through inspectors of the different localities where the manufacture was carried on—the distribution of bounties for the saving of Flax seed,—the hand spininng of fine yarn, the erection of scutch-mills, and the establishment of spinning factories. The funds applicable to these purposes from 1711 to 1737 averaged about £6,000 per annum, but soon rose to £20,600, and were fixed by Parliament at the latter sum during a long subsequent period.

Notwithstanding the abuses attending the ounty system, the Linen Board was productive of much benefit to the nation.

It has been succeeded by the Royal Society for the promotion and improvement of the growth of Flax in Ireland, which continues the system of teaching, for the instruction of persons in districts where Flax is being introduced.

Under the old system of manufacture, when the weavers brought their webs to market, the bleachers or Linen dealers attended to purchase. The yarn is now purchased by the manufacturer, who boils it, winds it and gives it to be woven by persons in his employment.

In 1725, machinery was first applied to the operations of washing, rubbing and beetling Linen. Up to 1761, buttermilk was the only acid used in the process of bleaching. In 1764, Dr. Ferguson received from the Linen Board a premium of £300 for the successful application of lime in the bleaching process. He introduced the use of sulphuric acid in 1770, and chloride of lime was brought into notice at a later period.

The proprietors of these bleach works either bleach Linen for hire, are themselves manufacturers, bleaching and exporting their own fabrics, or are purchasers of brown linen, and export it when bleached.

The consumption of Linen in Gaeat Britain and Ireland has been variously estimated, being placed by some at three-fourths of the entire make, and by others at one-third. It appears from the comparative quantities exported to foreign markets, that the populaton of America consumes more than two yards of British and Irish Linen per head annually, while Europe takes but one thirty-eighth of a yard per head; the Linens of all countries being admitted in the New World at a

moderate rate of duty, while duties more or less prohibitory are imposed by the different countries of Europe.

Retteries or Flax factories so completely systematise the process of Flax preparation, and introduce that division of labor which is so conducive to perfection of workmanship, that they demand a more extended notice.

Their general management has been previously examined. A more detailed description will convey to those unacquainted with the subject a clearer idea of their economy.

Flax-straw with the seed on is purchased from the farmer at a fixed rate per ton ; it is sometimes sold out of stook, but it is better if it has been stacked for a short time, as there is less risk of heating when built in large stacks, and also less loss by drying. Some large concerns have lost from the last item alone as much as £300 per annum.

Each farmer's straw is kept separate from others in its different stages, viz :— Stacking, seeding, steeping, drying, and scutching. By this means its loss by seeding, and the yield of fibre can be more readily determined, affording to the purchaser a criterion for his guidance in future years.

Round stacks with ventilators in the centre are preferred, the whole resting on cast metal pillars (Fig. 1) with inverted dish-shaped caps of the same material. These prevent injury being done to the straw, by rats ormice.

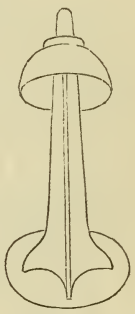


Fig. 1.

All extensive factories of the kind under consideration, have rail-roads for trucks radiating from them in different directions. Among these one to the stack-yard, with a view to the easy and rapid carriage of the straw to the seeding-house.

It is again weighed and the loss in stack ascertained. The seed is taken off by means of cast iron rollers, (Fig. 2) making twelve revolutions per minute. They are solid, nineteen inches in length and twelve in diameter. A handful of straw is taken by the operator and the seed end passed between the rollers at A, the root end being firmly held by the hand This isrepeated three or four times, and the bolls are sufficiently crushed. The roller B, is free to move upwards.

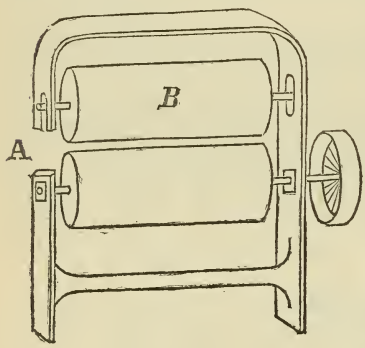


Fig. 2.

A different apparatus for seeding has been described on a previous page.

Seeding in winter is a constant operation. The greater the quantity sold to farmers for sowing the greater is the profit, as the price for crushing purposes is less.

In factories working twelve vats, two sets ofseeding rollers will be required. A ground-planofarranging these and their accompainments is represented by Fig. 3.

A little girl, A, opens the bundles of straw, passes them to B, who divides them and gives them to the seeder C. She places them on the square table from which they are taken by D, whose duty it is to pass theseed end through the buffing machine to separate the chaff.

This is a covered cylinder, three feet in diameter, and five feet in length, making one hundred and thirty revolutions per minute. On its circumference are six rows of wooden teeth, each twelve inches long, and distant from each other one and a-half inches at base.

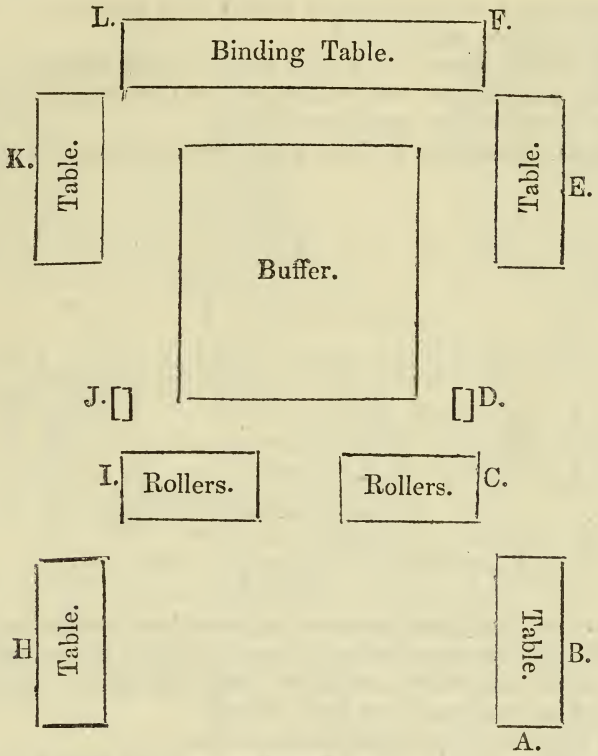


Fig. 3.

E, either straightens the root end by hand, or puts a loose bundle in a machine for the purpose, from which it is taken by F, and bound.

The same routine is performed on the opposite side.

If more straw is seeded than is required for steeping, it is re-stacked.

Six tons of straw with the seed on may be done by two sets of rollers per day, at a cost of two shillings and ten pence per ton.

All the seed, chaff, and uncrushed bolls that come from the seeding rollers are passed through a machine, (Fig. 4,) having two sieves. The wires in sieve A, are about $\frac{3}{16}$ of an inch apart, those in sieve C, $\frac{1}{16}$ of an inch.

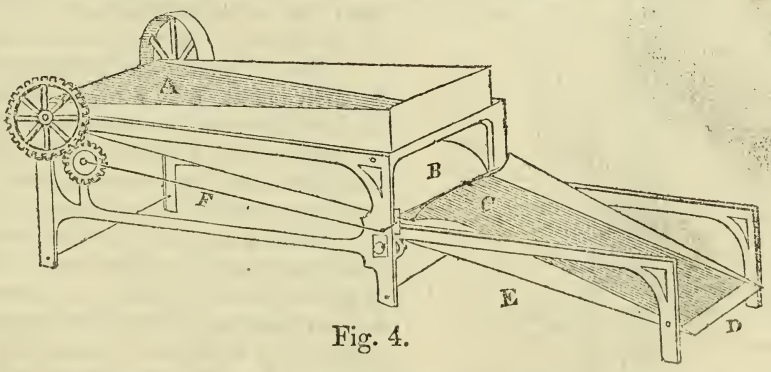


Fig. 4.

The flax-seed, chaff, and sand fall through it, upon the shuffle-board B, which delivers them to C, through which all the seed and fine dust fall at E. The chaff passes over to the floor at F. A cam gives motion to it, causing it to rise and fall

with a jerk. A horizontal motion is given to B by the crank-rod F, worked by the pinion G. C has a motion similar to A.

The uncrushed bolls separated by the sieve A, are either crushed, or sold to farmers for feeding purposes at one shilling and two pence per bushel. The chaff is worth from two pence to four pence per bushel.

An arrangement is made at E, (Fig. 4,) by which elevators raise the seed to the hopper A, (Fig. 5.)

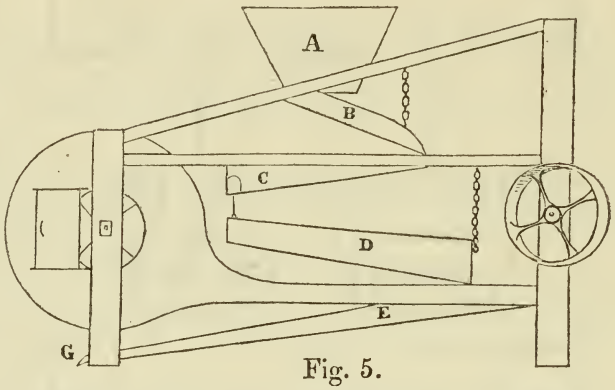


Fig. 5.

In this side view of the fanners are represented two shuffle-boards (B, D,) having a horizontal motion from cranks, and two sieves (C, E,) moved by cams. The sieve C is made of parallel wires, and E of perforated zinc. The blast from the fanners passes at F as the seed drops from D to E.

The seed is bagged at G, or spread on the floor,

The average yield of clean seed from a ton of unthrashed straw is about five bushels, of chaff, eighteen, and of bolls, three bushels.

Other machinery for the same purposes as those here treated, may be found in operation.

Steeping is the next step, or it may be that some prefer steaming. Up to this point the processes are common to both systems, but now the similarity ceases.

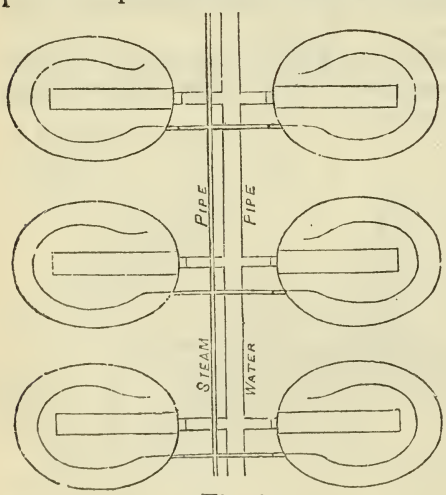


Fig. 6.

I will notice here, the method of schenck. Fig. 6 is a ground plan of six vats, showing also, the steam-pipe and water-pipe. Water is admitted by this pipe from a reservoir or tank on a higher level than the surface of the vats. This is heated by steam, to any required temperature.

Vats (Fig. 7,) are generally made of 2½ inch plank, 6 ft. 8 in. in depth, 9 ft. 6 in. in transverse diameter, and 13 ft. 6 in. in longitudinal diameter. They have false bottoms covering the steam coil; and covers represented as put together by Fig. 8.

To fill a vat, three or four beets of flax-straw are placed on their side, in one end. A row of beets is then put across the vat in the direction of its shorter diameter, and resting on their root ends, in a somewhat inclining position. Another row, but inverted, is placed against this, and so on till the opposite end of the vat is reached. The division floor is then put on, and a like quantity of flax-straw placed on top. The cover is then firmly secured in its place.

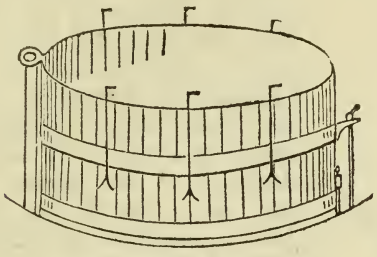


Fig. 7.

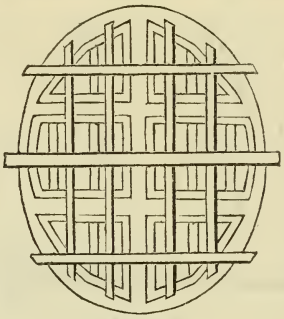


Fig. 8.

We have seen that water can be admitted at any required temperature That at present most desirable, is 90° Fah.

A		°		267	
Apl.	6	9	12	3	6
15					90
16	90	90	89	89	89
17	90	90	89	89	89
18	88	88	88	87	87

Fig. 9.

That the minute attention paid in some establishments, to this particular part of the process may be seen, I give a form of board in use, (Fig. 9,) one of which is placed opposite each vat.

A, tells where the flax was grown; the number 267 indicates the number of times this individual vat has been filled since the beginning of the year; 15, &c., in the margin, denote the days of the month, and the figures opposite are the temperatures, which are taken and recorded every three hours, as at 6, 9, 12 o'clock, &c.

We will suppose that water at 90° has covered the straw in the vat, and that the supply has been checked. Fermentation ensues, and carbonic gas begins to be evolved in four hours afterwards. The flax stems swell, and water is forced into the overflow-pipe. A white froth and scum now appear on the surface, and gather as the evolution of gas increases. The water is changed in color and taste. Hydrogen must also escape, as the application of a light ignites the whole surface of the water in the vat.

Sufficient water at 90° is now admitted, to cause an overflow, which removes impurities, and leaves the flax in a fairer condition.

If the temperature falls too low, steam is easily let on to raise it to the required height.

Before the introduction of wet rolling, flax-straw was steeped for sixty and seventy hours. This improvement, with judicious management, has reduced the time to forty.

When fermentation has proceeded far enough, the vats are emptied, and the straw is immediately rolled. Before being caught by the rollers (Fig. 10) jets of pure water from a pipe above the feed table, fall upon it with a cleansing effect.

After passing the first pair, it is taken by a second and a third, between which it may be turned. Much of the epidermis is thus removed, thereby facilitating the subsequent processes of drying and scutching.

A system of levers is applied to each pair of rollers, which may be understood by a reference to Fig. 11.

The weight A, equals 124 lbs. Its

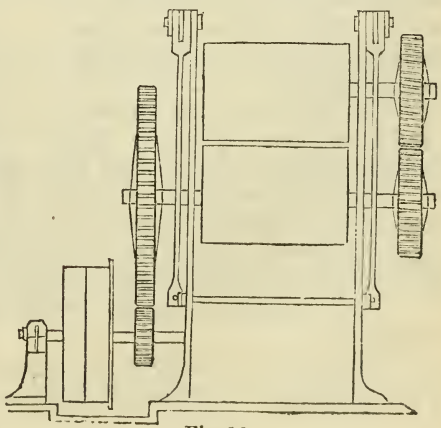


Fig. 10.

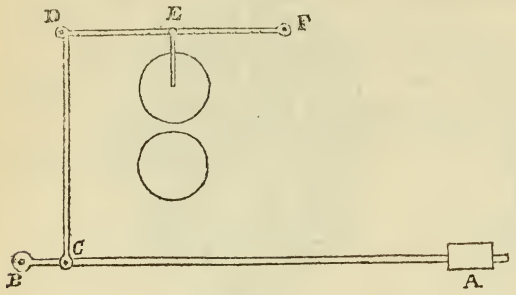


Fig. 11.

distance from the prop B, is 43 in. and the distance of the power C, from the prop is 3 in., therefore $\frac{124 \times 43}{3} = 1777$ lbs., the power. Calling this power the weight in the upper lever, its distance from the prop F equals 17 in., and the distance of the power E, from the prop is 9 in., therefore $\frac{177}{9} = 3356$ lbs., the pressure on the flax as it passes through each pair of rollers.

All kinds of flax will not bear the same amount of pressure. This however, is easily graduated by moving the weight A, nearer the power C.

As the Flax leaves the rollers it may be treated in different ways which are described in order.



Fig. 12.

The first is field drying, which is by far the best, if sudden changes of weather were not to be encountered. Even with this drawback it must not be overlooked.

A woman puts a band round the top of a bundle of Flax after it leaves the rollers; these are laid on a truck, and carried by rail to the field. They are dexterously set on end in a sugar-loaf form (Fig. 12) and known as rickles. In some retteries, the bands are taken off, and the ends opened. When perfectly dry, they are bound and put in stacks.

But Flax may be put in holders as it comes from the rollers, and dried in sheds in the field, or by hot-air in the drying-house.

Holders are made of two pieces of wood of various lengths, on the ends of one of which are two rings of wire, which, when drawn over the ends of the other, hold the Flax evenly spread.

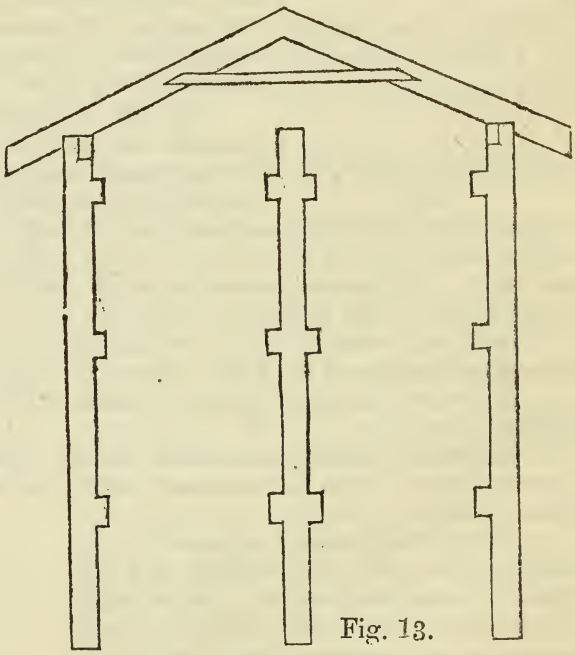


Fig. 13.

An end view of a drying shed is represented by Fig. 13, in which there are two rows with three tiers in each.

The next method of drying is by stove, in what are sometimes termed desiccating houses. These can be at work at all times, thereby enabling the manufacturer to control his own operations. But it has been observed that Flax thus dried is somewhat deteriorated in quality.

Two methods of hot-air drying are in use, each of which merits a sep notice.

In Fig. 14, A. represents fanners which drive cold air through a range of pipes, (C) only one of which is here

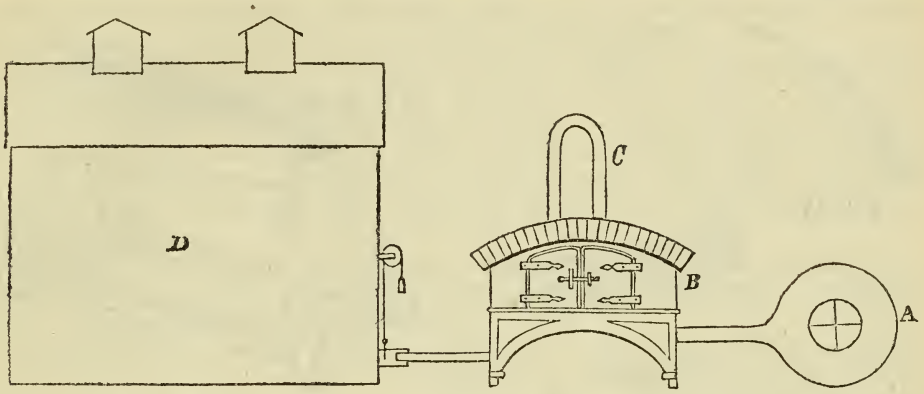


Fig. 14.

shown. The flame from the fire in B passes among these pipes, bringing them to a red heat. The air, in its passage through these, is necessarily warmed, and enters the drying house (D) at a temperature of 140°. Here Flax is dried in from eighteen to twenty-four hours. Much fuel is used by this method.

The stove represented by Fig. 15, consists of twenty-one pipes arranged horizontally in three rows of seven each. They are six feet in length, underneath,

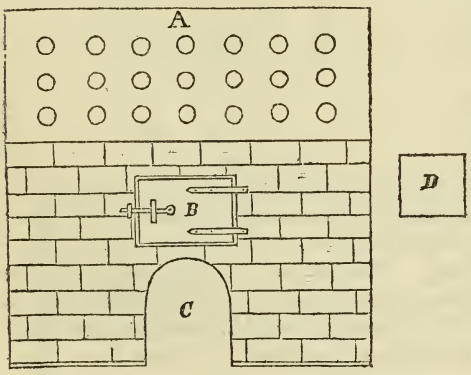


Fig. 15.

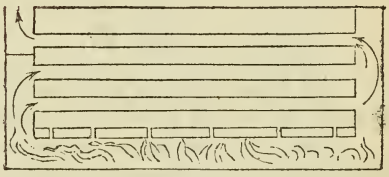


Fig. 16.

but separated from them by bricks, is a fire of coke. The arrows (Fig. 16) show the course of the flame.

In Fig. 15, A shows the ends of the tubes, B the fire, C the ash-pit, and D the cold-air flue. The air admitted by this flue circulates among the pipes, is heated there, and escapes through an aperture above them into an iron chamber on the floor of the drying-house, which it now fills.

Drying-houses generally admit three tiers of Flax in height, and six rows in width. Rows of studs are set up, reaching from floor to ceiling. Horizontal bars are nailed to these in a longitudinal direction, on which the holders are suspended. The apartments are air-tight above. The only means of escape for the air as it beccomes charged with moisture, being by descent to apertures in the floor leading to shafts, and up these to ventilators in the roof.

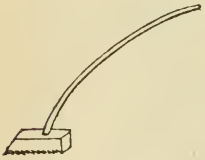


Fig. 17.

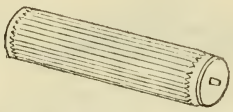


Fig. 18.

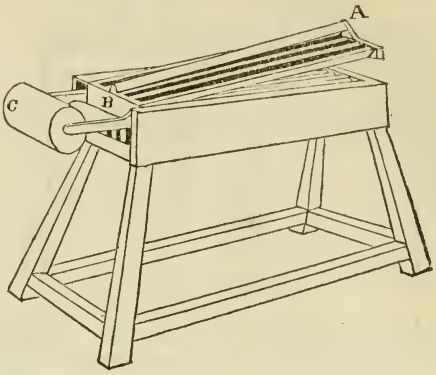


Fig. 19.

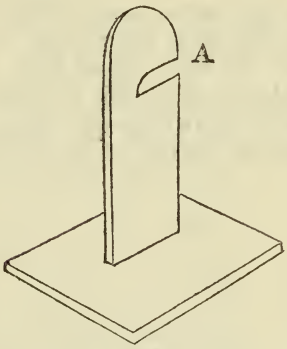


Fig. 21.



Fig. 20.

All Flax, after drying, improves by stacking. Technically speaking, it *comes.* Temporary sheds answer every purpose, if the roofs are water-tight.

The next operation, in order, is scutching. The straw, in its passage to the scutching-room, is again weighed, and the loss by steeping and drying ascertained.

Before scutching, it is usual to pass the Flax-straw through a breaking machine. Since the introduction of wet-rolling, and scutching machines, this has been partially discontinued.

The simplest form of break is of a mallet shape, (Fig. 17) and is much used in Belgium. The Flax is broken by successive blows from its serrated surface.

Another form of hand-break is represented by Fig. 18, which consists mainly of two sparred frames, the upper movable on an axis at B, and the lower fixed. It is so constructed that the bars in the lower frame fit between those of the upper. The operator takes hold of the implement by the left hand at A, and with the right places some flax over the lower frame; the upper frame is then lowered, thereby breaking the woody portion of the stems. The flax is successively brought forward and broken, until ready for hand-scutching.

Breaking in retteries is better done by machinery than by hand. Fluted rollers of wood or metal are mostly used. One of these is represented by Fig. 19. Four or five pair of these work in a machine, one above another in each pair. The flax is fed from a table, and caught between the first pair, then by the second, third, fourth, and so on in succession.

These rollers are seven inches in diameter. The teeth of the two first pair project an inch, and are severally one and a quarter, and one inch distant from breaking edge. Those of the three last pair project a little more than half an inch, and are three-fourths of an inch apart.

The first pair revolves a little slower than the second, the second than the third, and so on. Pressure is given and regulated by weights.

Hand-scutching of flax is still a very common practice; but it is tedious and expensive on the whole. The simplest apparatus for the purpose is represented by Figs. 20, and 21. The former is the flat blade or sword, with its balancing point, and the latter is the stock, in a slit in which A, a handful of flax is held by the left hand of the operator, and struck by the scutcher in his right. New surfaces of the flax are presented to the blade, till all the wood is beaten out, and it is perfectly clean.

After flax is broken it is stricked, that is, made into stricks for the scutchers. A strick is as much flax as one hand can grasp, evenly arranged, and slightly twisted. One girl stricks for two scutchers.

In mill scutching several wheels are fixed on a shaft, distant from each other three feet or more. It will be seen by Fig. 22, that scutching blades of wood or metal, are screwed to the periphery of these wheels. Upright pieces of metal (B) called stocks, are so placed, that the blades as they revolve pass near their surfaces. The tops of these stands are sometimes on a level with the shaft, and sometimes higher. The blades are $\frac{6}{8}$ inch, and $\frac{7}{8}$ inch from stock at striking point, and $\frac{4}{8}$ and $\frac{5}{8}$ at heel. Wheels are three feet six inches in diameter.

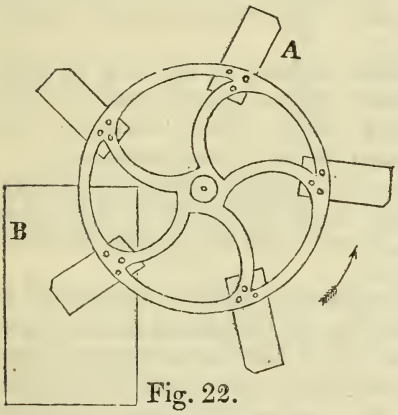


Fig. 22.

A boy supplies each scutcher with straw, weighs each bundle before delivering it, and enters the quantity against his name. This is a simple form of entry.

Name.	Straw.	Flax.	Yield per cent

Fig. 23.

The quantity of scutched flax done by each workman per day is weighed, the percentage of fibre from the straw calculated, and the comparative merits of the several scutchers ascertained. Scutching-weels make from two hundred to two hundred and fifty revolutions per minute. They are covered in to prevent dust and accidents.

It was before noted that scutching machines are now made which do away with skilled labor.

A large per centage of codilla, or more commonly, tow, is made in scutching. Different methods are in use to effect the separaron of the shove or woody stem. Tow machines are a substitute for hand-picking. Fig. 24 gives a front view of one of these. The wooden arms A, which project in front, are alternately raised and depresed by cranks on their respective axles, connected by rods with others on the driving shaft below.

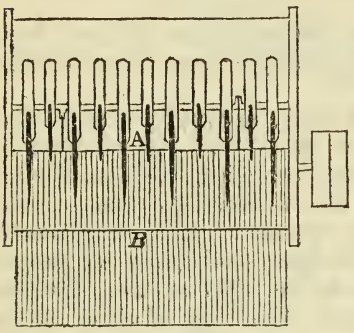
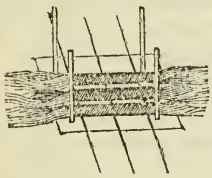


Fig. 2

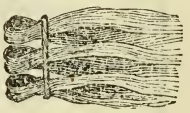
The alternate striking of the tow by these arms has the effect of separating the shoves which fall through the wires B. These shoves are commonly burned and the ashes used as manure.

Tow, like flax, varies much in quality. There are A 1, A 2, B, C tow, &c. A 1 comes from the sorters', A 2 from the scutchers' bags; B and C are the codilla from the machine.

Flax is taken from the scutchers to the sorting-room. Here it is sorted into first, second, and third qualities, each determined by the judgment of the workman. It is commonly made up in bundles or stones of fourteen pounds each. One method is represented by Fig. 25, in which the sorter lays the stricks lengthwise over three bands, with which the bundle is tied when finished.


Fig. 25.

By another method a twist is given to the strick. It is then doubled at the centre and the two ends brought together as in Fig. 26. A band is then passed round their twisted ends, making them ready for bagging. Two hundred weight are put in each bale, or sixteen stones of fourteen pounds each. The flax is now ready for market.


Fig. 26.

A store-room for flax is no unimportant part of a flax factory. If flax is kept too dry it loses in weight and quality. It should be closely packed together in a dark and damp apartment.

Flax has now been brought to that state in which it is purchased by the spinner. But before saying anything of spinning, a description of a Watt's chamber for steaming will serve to complete the routine of flax preparation.

It has been before observed that the only point of difference at the present day between the system of Schenck and that of Watt is that in the former, fermentation at a high temperature is its main feature, while in the latter, the chief characteristic is maceration without fermentation. To Watt, however, is due the extensive introduction of wet rolling.

A chamber, of which Fig. 27 is a section, may be described as a hollow, air-tight vessel, made of cast iron plates. It is about twelve feet inlength, six feet in width, and six feet in depth, including the space between the false and true bottom, which is about nine inches in depth; but not including the condensing cistern, (A,) on top of the chamber, which is sixteen inches.

The hot water cistern, (B,) set in the condensing cistern is three feet square. A tube, (C,) in the interior of the chamber and running lengthwise is connected with it, by which the chamber is two-thirds filled with liquor immediately before steam is admitted.

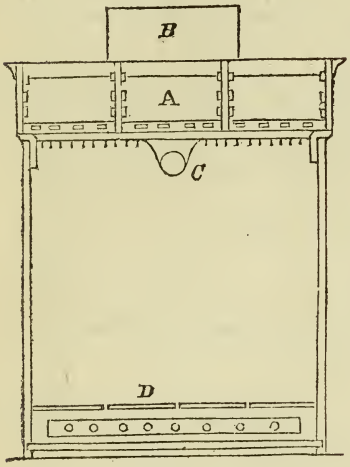


Fig. 27.

In the interior of the chamber we find the steam pipe between the false and true bottom pierced with holes to allow the escape of steam. Above the steam pipe is the false bottom (D,) consisting of perforated plates, supported by a frame work on feet: also a bar connecting the two sides of the chamber to prevent their expansion or collapse.

On the outside of the chamber are found an air-valve, for the admission of air when steam is shut off, two cocks to indicate the quantity of water in the chamber; and two doors, one in each end opening outwards, each 2 feet 5 inches square. These are used for filling and emptying, and are screwed up and made steam tight by a gaskin of tow. There is also a pipe for admitting steam to the chamber, (exhaust steam from the engine is used,) and another for the escape of the steep liquor. Surplus steam escapes by a safety-valve on top.

When flax is ready to be taken out of the chamber, the steep liquor is drawn off into an underground cistern, and there mixed with the overflow from the condensing cistern with a view to its future use in other chambers. The same regard is not had in practice for a condensing surface on top of the chamber as the theory of Watt's system exhibits.

The test by which flax is known to be sufficiently steamed, is the easy separation of the epidermi between the finger and the thumb. All subsequent operations in this system, as rolling, drying, scutching &c., resemble those already described, and require no separate notice.

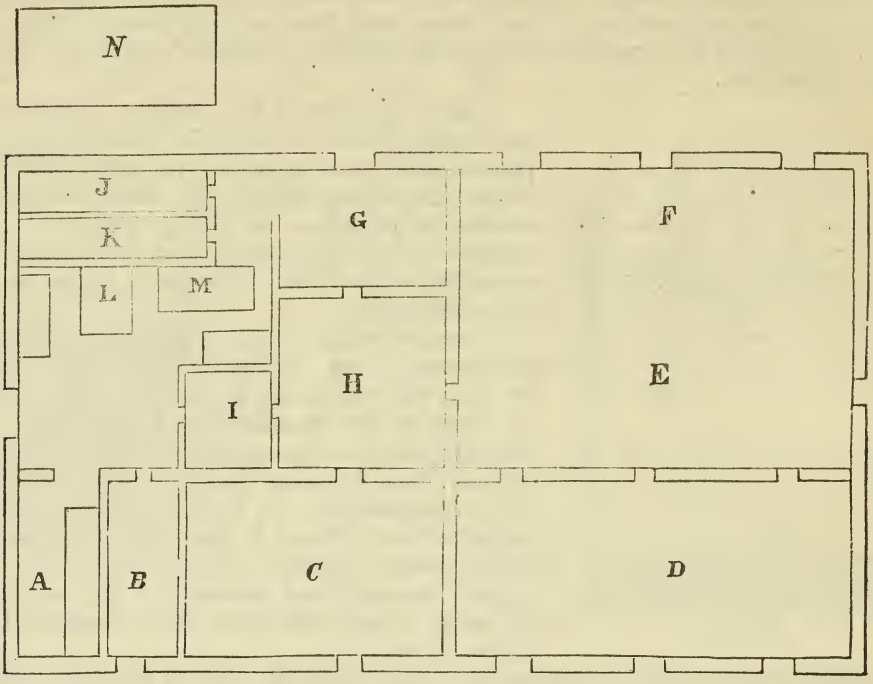
Figure 28 represents a ground plan of a Flax Factory on the system of Schenck. A is the boiler-house; B, the engine-room; C, the scutch mill; D, the seeding-house; E, the steeping-house for the vats; F, the wet-rolling house; both of which are under the same roof; G is the tow-room; H may be used as a store-house; I is a workshop; J and K are drying-houses; N is the reservoir which supplies the establishment with water, among other things the tank L, in which water may be heated by steam for the vats; and M is the stove.

Grounds for a stack-yard and drying field are usually attached to a rettery of this description.

Flax passes from the rettery to the store of the spinning-mill, from which it is selected and roughed. The finer qualities are taken to the Flax-breaker, where the ends are cut off. These are called cut-line, and are spun to low numbers. The remainder is called long middles. The object of cutting is to remove all scabs and impurities which generally exist in the ends of Flax.

After cutting, it is hackled by machinery and taken to the sorting department, where it is selected for different numbers, either for warps or wefts, according to the judgment of the operator.

The tow from the hackling machines is carded and spun to 40 s. and 50 s., for coarse fabrics, as towels, sheetings, &c. It is called first, second, and third machine tow.



[Scale, 40 feet to the inch.

Fig. 28

Flax, after dressing, is taken to the spread board, where the cut-line is spread in four slivers. These are seized in the retaining rollers, and afterwards caught on the reach by the gill. The reach is the distance from the retaining to the delivering roller. This varies according to the quality of Flax worked. The delivering roller makes from twenty to thirty revolutions for one of the retaining, thereby drawing the sliver twenty or thirty times.

Four slivers are united into one, and received in a can holding a certain quantity, which is announced by the ringing of a bell, when the can is doffed. The cans so doffed are put up for a second drawing behind another frame, pass over the reach as before, are drawn twelve times, and twelve slivers united into one or two. We have now 12 x 20 = 240.

These slivers are taken to the third drawing frame, where the same process is repeated, that is, again drawn out twelve times, therefore 12 x 240 = 2880, which is the number of times the original sliver has been extended.

The cans are now set behind the roving frame, where the sliver passes over the reach, and is delivered on a bobbin, receiving a twist from the flyer.

Bobbins from the roving frame are taken to the spinning frame. Here they pass through troughs in which water is heated from 100° to 150° by steam, thence to fluted rollers, the reach of which is longer or shorter as the sort spun is finer or coarser.

Finer numbers receive more twist than coarser.

Yarns pass from the spinning to the reeling room. Reels are 90 inches in circumference; each contains 20 hanks, each hank twelve cuts, and each cut 300 yards.

These yarns are taken to the drying loft, and subjected to a high temperature and when dried made up into bunches for market. Here I will leave them, merely remarking that they are now ready to appear as a textile fabric, assuming the ap-

pearance of ordinary linen, or a damask table cloth. In either case before finally showing themselves in the warehouse of the merchant, they must undergo the operation of bleaching, which itself supports large manufactories.

The best mo les of flax cultivation in Europe have now been exhibited, and the different methods of preparing the fibre for market have been more or less minutely examined.

Many years will no doubt elapse before the cultivation of the plant in this country becomes general. Yet much may be accomplished by vigorous efforts. If the farmer grows flax, he naturally looks for a market. If a capitalist builds a flax mill, he as naturally looks for a supply of flax. Herein is the first great difficulty. When this is surmounted, the Gordian knot is cut.

Hoping that the present report may contribute to this object.

I have the honor to be,
Sir,
Your most obedient servant,

A. KIRKWOOD.

To the Honorable John Rolph,
Minister of Agriculture,
&c., &c., &c.

Sir,—I received the following communication shortly after the day on which it bears date :

Bureau of Agriculture,
Quebec, 24th March, 1853.

Sir,—As I desire to make the Bureau of Agriculture useful to Canada at as early a day as possible, and to keep up that spirit of improvement which has evidently been awakened, I have taken various means to obtain information, and I now desire your services for a short time for the same purpose

I therefore authorize you to proceed to New York, Boston, Philadelphia, and other cities of the United States, where such information is likely to be obtained, and to examine and report to me upon the various implements that have been introduced and deemed worthy of Patent ; and also upon any new variety of seeds and vegetables, of which you may be able to obtain information, and which you may consider adapted to Canada ; and generally to report upon such other articles as you may deem useful to Canadian Agriculture, with a view to action by this Department, and the Boards of Agriculture, in promoting their introduction into this Province.

I have the honour to be,
Sir,
Your obedient Servant,

(Signed) MALCOLM CAMERON,
Minister of Agriculture.

Wm. McDougal, Esquire,
Proprietor of the Canadian Agriculturist.

I have now the honor to state for your information, that upon the receipt of the above, from the late Minister of Agriculture, I proceeded to make the necessary arrangements to perform the service required of me. The New York exhibition of the Industry of all Nations, was expected to open in the month of May; and believing that I should there find all the important new inventions, in Agricultural Mechanics, not yet introduced into the Province, as well as other objects to which it might be desirable to direct the attention of the Minister of Agriculture, I determined to pospone my departure for a few weeks.

I afterwards learned from the Honorable M. Cameron, that it was his wish to meet me at the Crystal Palace, on the subject of my mission, and other matters pertaining to the Bureau of Agriculture. The opening of the Exhibition was delayed some weeks beyond the appointed time, and when finally opened it was understood to present for examination a portion only of those articles for which space had been appropriated. After a considerable delay from the causes mentioned, and learning from the Honorable M. Cameron that he would not be able to visit the Exhibition as he had intended, I proceeded, on the 9th of August, to execute the mission with which that gentleman had honored me.

Looking at the terms of M. Cameron's letter, I found that I was authorised to "examine and report upon such Implements, Seeds, Vegetables, and other "articles, as I might deem useful to Canadian Agriculture, with a view to their "introduction into this Province," through the agency of the Bureau, and Boards of Agriculture.

Assuming that the interference, or assistance of Government, was intended to be confined to those cases in which private enterprise would not be likely to achieve the end desired, except perhaps after long delay and consequent loss to the Agriculture of the Province. I felt bound to limit this branch of my enquiries, to a comparatively small class of objects. Boston and Philadelphia, were suggested as cities which might be visited with advantage.

It would have given me, personally, great pleasure to have acted upon these suggestions; but I could not learn that information on the subjects contemplated in my instructions was likely to be obtained in either of those cities, which was not equally accessible in Albany, the Crystal Palace, or other sources in New York. I did not therefore extend my investigations over so wide a territory or protract them for so long a period as the general terms of my commission might be held to warrant.

The Agricultural machines and implements of *recent* invention, that came under my notice, or of which I could obtain reliable information, were neither very numerous, nor, in an economie point of view, very important. The number of those which I feel warranted in recommending for importation at the public expense, is small indeed; and if my report were limited to a mere description of this class of objects it would comprise but a few pages. My observations will be more diffuse and suggestive than I had expected to make them.

The progressive increase in the wages of labour; the rapid exhaustion of the soil, under a rude and wasteful system of culture, which has prevailed over this continent, and is probably incidental to all new countries; the certainty of sale for all his productions; the better price, and the "quick returns" which a dense population at home, and never glutted markets, abroad, secure to the farmer, have rendered necessary as well as profitable the employment of machinery in Agriculture, of a more complicated and expensive kind than has ever been practicable at any former period. In Great Britain the same necessity has grown up, though from somewhat different causes.

The astonishment created among the farmers of that country by the succesful operation of the American Reaper at the World's Fair, in 1851, which was in no degree lessened by the discovery, that this identical Reaper was the invention of a Mr.

Ogle, of Rennington, near Alnwick, as far back as 1822, * while it showed the existence of a blind unreasoning prejudice in the Agricultural mind, against the most valuable offerings of mechanical ingenuity, indicated also that this prejudice was fast melting away before the convincing logic of necessity. The same instinctive hostility to new inventions and new processes in agriculture prevails in Canada among a large class of farmers. But every year extends the conquest of innovation, and though we are still behind our inventive and enterprising neighbours in the use of Agricultural Machinery, I firmly believe we shall soon overtake them—nay that we shall surpass them in *the superior construction, and more economical* use of such implements, and machines as are adapted to our wants.

During the last two or three years, manufactories of farmers tools and implements have been established in all the principal towns and cities in Upper Canada. So great is the demand for improved machinery that even American manufacturers have set up branch establishments in Canada, with very profitable results.

Labour and materials being cheaper here than in the adjoining States, *enterprise* seems all that is necessary to produce, *at home*, every implement required. This favorable improvement in the mechanics of Agriculture, (I speak more particularly of Upper Canada) is undoutedly attributable to the influence of the Societies, Associations, and Boards of Agriculture, which the Legislature has so wisely encouraged, and so liberally aided. The provisions of the consolidated Bill of last session, to prevent abuse in the expenditure of the public grants, and to secure the collection and publication of the Agricultural statistics of the country, in an authentic form, will, as experience already proves, produce the desiredr esult and leave but little for the direct interference of the Government beyond the Executive Administration of the law.

With such views of the present condition of our Agriculture, and the efficiency of the means already provided for ensuring its progressive improvement, you will not expect me to recommend a competition between the Bureau, or Boards of Agriculture, and private individuals, in the importation of implements, Seeds and animals, from other countries; that there are a few cases in which the special and direct aid of the Government may be legitimately and usefully interposed, is admitted; as the result of my enquiries, I can only mentioned two or three which at present seem to me to deserve your attention as belonging to this class.

Flax machinery &c. The introduction of improved machinery for dressing and preparing flax is necessary, if its cultivation is to be extended. This is one of the cases which is thought to need the aid of the Bureau, and I shall therefore offer a few remarks upon it.

It may well be doubted, if the culture of the flax is as important to Canada, in an economic point of view, as it is fashionable to represent it. As a general rule, farmers will cultivate those crops suited to their soil and circumstances. At all events, it is not to be supposed that the intelligent and wealthy class, now not a small one, will long neglect those crops which, upon the whole, will yield the most profitable returns. There are in this country no legal restrictions, or impedements to be removed, no obstacles to be overcome, except those which nature has imposed. The Canadian farmer may freely choose from the world's seed store; he may range over the whole vegetable kingdom and make his selections without let or hindrance. For what purpose then should Government interfere? not to divert farmers from the cultivation of those crops which they have found adapted to their soil, climate, and market facilities, and to build up, by means of bounties, or premiums, an artificial, hot-house system; such interference would, in my opinion, be injurious to the best interests of the farmers, and of the country. To encourage, to stimulate, to diffuse information, and by means of societies and Boards of Agriculture among the

(*) See the London "Mechanic's Magazine" for November, 1825, which contains an exact description of M'Cormick's Reaper in all essential points.

farmers themselves, to promote *general* improvement, is the duty of Government. But special action must be limited to a very few cases, and such as lie beyond the reach of common means, or injury, and not benefit, may be the result.

The more general cultivation of flax might not be productive of injury to the soil or pocket of the Canadian farmer; but it may safely be affirmed that neither the one, nor the other, has received much benefit hitherto from its cultivation for textile purposes. The experiment has not been confined to a few cases, nor to a single township I have published an Agricultural Journal for the last six or seven years in Upper Canada, and during that period, as well as previously, have heard, and read, and published many statements and opinions upon this subject. But I am not aware that it has ever been demonstrated, by actual experiment in Upper Canada, that flax, as a field crop, is more beneficial, or more profitable, than the poorest of those which form the common rotation. In several cases coming under my observation, its cultivation, except for seed, and mere domestic purposes, has been abandoned after a short trial. But it is said, that the unprofitableness of the flax crop arises from the *small quantity* grown in any one locality, and the want of suitable *machinery* to prepare it for market. The first reason may be merged in the second; if the machinery for steeping or steaming and dressing the straw as it comes from the field, were set up in any county, and a sufficient price offered for the raw material, producers, in abundance, would undoubtedly be found. It is true that farmers, generally, are not friendly to this crop o naccount of its supposed deteriorating effect upon the soil. Science has recently endeavoured to show that this is a mistaken notion—a prejudice; but when the conclusions of chemical analysis, and of two thousand years experience, conflict on a point of this kind, we ought rather, I think, to suspect some blunder in the laboratory, than in the field. The experience of Roman cultivators, nineteen hundred years ago, taught them that flax burned the land (Virgils Georgics I. 77). A distinguished modern writer on Agriculture informs us, that—The Premiums given by the Legislature of England to force the cultivation of flax, have had very little effect, it being one of the most *exhausting* crops, when allowed to ripen; its seed and culture being found to be much less profitable than corn,—(*Farmers' Encyclopœdia, article Flax.*) But as "all crops, and especially cereals," exhaust the land, and compel the cultivator to return in the shape of manure the exhasted elements, if he wishes to prevent deterioration, this objection to flax is not peculiar or insuperable; it resolves itself, after all, into the question—Will it pay?

Let it be shown that the expense of growing flax and keeping up the fertility of the soil will be met by the profits, and that the margin of profits will be larger than in the case of wheat, oats or pease, and it will soon take its place in rotation with these crops. We may therefore enquire into the alledged cause of its present unprofitableness, without stopping to reconcile the conflicting testimony of chemistry and experience.

Professor Wilson, the English Commissioner to the New York Exhibition, whose acquaintance I had the good fortune to make at the Crystal Palace, informed me that England alone imported annually 100,000 tons of the raw material. He expressed a very confident belief, that flax could be grown profitably in the United States, and Canada, for exportation to England; but his data were somewhat vague and unsatisfactory. (*) He very kindly presented me some recent publications on

*Since this was written, Professor Wilson delivered a lecture on flax before the Agricultural Association of Lower Canada. The published report contains much interesting information, but no *figures* by which the expense of growing and preparing flax for exportation can be calculated with any certainty, nor is the commercial value of the fibre in England, definitely stated. In his Lecture before the New York State Agricultural Society, at Saratoga, (published by Saxton, New York,) he mentions *three* pieces. "The samples produced by Watts method, he tells us, varied from £56 to £70 per ton." The value of the dressed fibre imported into England is stated in an another part of the Lecture, at "£40 per ton."

Donlam's Prospectus of 1852 and other authorities state the value of the fibre at £32 per ton!

the subject. The information derived from these sources, though interesting and useful, is not so conclusive or satisfactory in its bearing upon the question I wish to submit for your consideration, as to warrant its introduction at any length in this report.

If it be admitted that there is a *market* in Great Britain, for all the flax fibre we are likely, under any circumstances, to produce for exportation, and that the only obstacle to the cultivation of flax for such a purpose, is the want of suitable machinery for pulling, dressing and preparing it on a large scale, the question arises—can such machinery be had, and ought Government to aid in procuring it?

Your predecessor, the Honorable M. Cameron, having sent a commissioner to Europe for the purpose of making special enquiries on the subject, I am bound to treat the second branch of the question, as already answered, in the affirmative. The doubts suggested as to the importance of flax culture *at all* in this country, are also partly set aside by the same fact; but as these doubts hinge on the single question of profit, the discovery of efficient machinery by which the fibre can be prepared for market at such a cost as to leave on ample profit to the producer will, of course, show them to be unfounded. Nevertheless, I beg most respectfully to call your attention to the economic view of the question, before you decide upon more active measures, or a larger expenditure.

In England, and especially in Ireland, every branch of flax manufacture has been made the subject of scientific investigation, with a view to its improvement; and we may therefore presume that the most economic processes, and the best machinery will be found in use there. Mr. Kirkwood has no doubt obtained the latest and most reliable information from that quarter; but as the Crystal Palace contains some newly invented machinery for dressing flax, which may not have been seen by him, it is proper that I should submit for your information, a short account of it.

Chichesters Flax Machines.—These were the only flax machines in the Exhibition, at the period of my visit. The machine Arcade was still unfinished, and many articles for which space had been secured, had not yet reached the Palace. Clemmon's Flax machine, or Dresser, is a new machine highly spoken of by some, but it was not in the Exhibition, nor was I able to learn much respecting it. Chichester's Machines consist of a Puller, a Brake, and a Dresser. The former, said to be ingeniously constructed, was not in the Exhibition. Professor Wilson, however, had seen it, and entertained a very sanguine opinion of its efficiency. One great obstacle to the growth of flax on a large scale, is the expense of pulling or harvesting. At present the pulling is done by hand, and unless machinery can be substituted for hand labour in the field, as well as in the manufactory, this expense will subtract largely from the farmers profit. It has been suggested that the common, as it may be now designated, moving machine will answer this purpose. If so, an important point is gained; or, if Mr. Chichester's Puller be found upon trial, to fulfil the requisite conditions (and many persons believe it will) the difficulty will be overcome. His Brake is not unlike a common Fanning Mill, in its appearance. Its machinery consists of two horizontal, corrugated cylinders, about twenty inches in diameter, and working together.

Their surfaces are composed of ribs, or plates of iron, every alternate plate being adjusted on spiral springs so as to yield to pressure, while the others are fixed firmly on the cylinder. As they revolve, each yielding rib in one cylinder is opposed to the fixed rib in the other. The flax is fed end-wise, at the side of the machine, and passes between the cylinders, being broken by the pressure of their ribbed surfaces.

The wood is thus broken and separated from the fibre; the former falling down, and the latter passing out at the other side of the machine, in a fit state to be subjected to the Dresser.

The Dresser is similar in appearance to the Brake, but its cylinders are of a conical shape, and composed of wood. Each cylinder is composed of four large

spiral blades of wood, the blades of one being opposite the spaces between the blades of the other. The fibre from the Brake is drawn in by these revolving cones. The blades strike it first on one side and then on the other, beating out the remaining wood or shives, and deliver the fibre, unbroken and free, from impurities. A specimen of flax, dressed by these machines, was shown, presenting a long, fine, white fibre, and was stated to be worth $400 to $500 per ton in the New York market. The two machines cost about £150 and may be driven by two horses. Four men are required to attend them. It is said they will dress a ton of rotted, or steeped straw, per day, which will yield from 400 to 500 lbs of fibre.

Some of these figures are evidently exaggerated, for if Professor Wilson be a good authority, the value of the fibre in England, prepared by the latest and most approved process, does not exceed, for the best quality, £70 sterling per ton, (see his lecture on flax delivered before the New York State Agricultural Society Sept., 1853, page 38,) and he gives the ordinary price at £40, per ton, (page 47). If, as is alleged, flax fibre be worth $500 per ton in New York, (see New York Tribune of September 28th, 1853,) Professor Wilson will hardly persuade the American producer to send it to the English market for $200 per ton. The question of profit and loss to the Canadian producer cannot be satisfactorily determined, unless we obtain correct data, on three points at least, viz. the cost of growing and pulling the crop; the cost of steeping and dressing the fibre, and the market value of the product. Mr. Kirkwood, I presume, has obtained accurate information on these points, especially the two last. I need not, therefore, attempt to reconcile the apparently conflicting statements above mentioned.

The cost of working Chichester's machine in the State of New York is thus stated by a New York Journal: "The two machines—Brake and Dresser—will "dress one ton per day of the rotted, or steeped, stalk or straw, yielding 375 to "400 lbs, according to the quantity of material, of soft and very serviceable line of "fibre. This, supposing the ton of rotted or steeped straw to be worth $12, the "labor $4, the power $1, the use and wear of machinery, &c., $3 more and $5 per "day for contingencies, would give $25 as the net cost of, say 400 lbs. of line, or "dressed flax, worth certainly not less than $50, giving a profit of $25 per day to "the runner or owner."

Buchanan's improved apparatus for steeping the straw, is according to Professor Wilson, the best hitherto employed in Great Britain, and I believed it is not claimed that any better plan has been discovered, or put into operation on this side of the Atlantic.

If you should determine to introduce, or to aid the introduction into Canada, of Buchanan's, or any other improved steeping apparatus, additional machinery will, I apprehend, be necessary to effect the mechanical separation of the fibre from the other parts of the plant. It may be that Chichester's Brake and Dresser, are the best yet contrived for that purpose. I therefore respectfully submit the foregoing statements, and suggestions for your consideration.

Drain Tile Machines.—There may be reason to doubt the advantages, to the Agriculture of the Province, of a more extended culture of flax; but it would be difficult to suggest a reasonable objection to the more general adoption of thorough drainage.

It is somewhat singular, that so few farmers, even of those recently from the "Old Country" where its benefits have been so thoroughly tested, have attempted thorough draining in Canada. It seems to be a common opinion that in this country, *surface* draining is sufficient, and that the expense of underdraining would be altogether disproportioned to its advantages. But if the principles on which the operation is based have been correctly explained, there is no reason to suppose that underdraining will prove less advantageous to the soil, or less remunerative to the pockets of Canadian Farmers, than to those of their neighbours in the State of New

York. Underdraining on the English system is now extensively practiced in the neighbourhood of Genessee, Albany, and New York, and according to the testimony of farmers with whom I conversed personally, the results have fully justified the expenditure. Professor Johnson, of Durham College, England, in a work entitled the Elements of Agricultural Chemistry and Geology, a new edition of which has just been issued from the press, thus sums up the advantages of thorough drainage :—

1. Stiff soils are more easily and more cheaply worked.
2. Lime and manure have more effect, and go further.
3. Seed time and harvest are earlier, and more sure.
4. Larger crops are reaped, and are of a better quality.
5. Valuable crops of wheat and turnips are made to grow where scanty crops of oats were formerly the chief return.
6. Naked fallows are rendered less necessary, and more profitable rotations can be introduced.
7. The climate is improved, and rendered not only more suited to the growth of crops, but more favorable to the health of man and other animals.

A system capable of conferring such advantages as these, obviously merits the attention of every Agriculturist, and ought not be overlooked even by Government. It does not appear that these advantages are limited to any particular district, soil or country. They depend upon conditions common to all. It is true that the underdraining is more needed, and will produce greater results on some soils than on others. The question may therefore be asked whether the soil on which it produces its greatest effects are to be found in Canada. I believe both theory and experience answer in the affirmative, and that the largest and, agriculturally speaking, the best portion of Upper Canada, is composed of such soils The stiff tenacious clays of some districts in England are not found in Canada. The climate of the Agricultural parts of the British Islands is also more equable and moist than ours, and for these and other reasons, it has been thought that underdraining was not so necessary here. But there are some evils to which the Canadian farmer is exposed, for which underdraining is the only remedy yet discovered, that the English farmer is in a great degree exempt from.

Our growing season is shorter and droughts are more frequent and more severe. In many parts of Upper Canada, and especially in low lands, the weather of last spring, proved fatal to the farmer's hopes. His crops could not be sown at the proper period, nor for weeks after it, and as very dry weather succeeded wet, his harvest completely failed. Now if underdraining will free the land of surplus water and fit it for the plough much earlier than would be practicable by any other means, the evil of a wet spring, so common in Canada, could be greatly mitigated, and, secondly, if the effect of the drain be to create a deeper seed-bed, thereby allowing the roots of plants to descend in search of food and moisture beyond the evaporating influence of the sun, much of the loss occasioned by the excessive droughts of summer would undoubtedly be prevented. And thirdly, it has been found, in the State of New York, that fall and spring frosts, so injurious to wheat, are comparatively innocuous on thorough drained lands. In that State, upon soils similar to ours, the benefits of drainage have been very thoroughly tested. It was supposed (before trial) that however beneficial the system might be for the stiff clays, and under the moist atmosphere of England, it would prove of little value in that State under ordinary circumstances. But experience has established a different conclusion. The circumstances of the farmer in New York State, as respects soil, climate, taxation, markets, &c., are so similar to those of his Canadian neighbour, that I shall assume their identity for all the purposes of this question.

What has been found good for the one, in a case like this, can hardly prove hurtful to the other.

The question of cost meets us on the threshold of this improvement, as on that of every other. Indeed, in this enquiry, it is almost the only one that required to be considered. It involves the chief difficulty.

Every intelligent farmer in the Province, either is or may easily be convined that under-draining would ameliorate his soil, and increase his productions; but he asks, Will it pay? Unless a cheap system can be devised, cheaper than any now in the farmer's reach, this question for some time to come remains without a satisfactory answer. It has been found in Great Britain and the United States that *Pipe Drain Tiles* are the cheapest and best material for the construction of under drains; and there seems no reason to

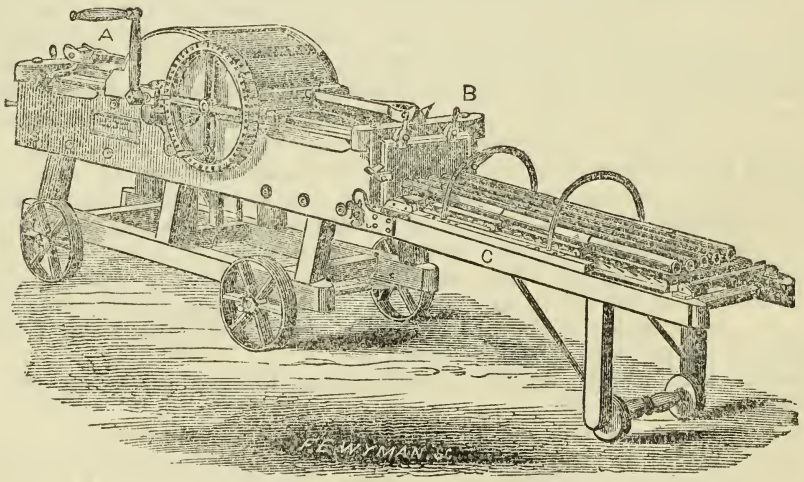
doubt, that if suitable machines were introduced, and the manufacture conducted on a proper scale, they would also be found the cheapest and best for Canada.

The Upper Canada Board of Agriculture, as you are aware have already had the subject of Drain Tile manufacture under their consideration, and have offered a premium to the person who shall first put in successful operation in Upper Canada a good Tile Machine*

At the suggestion of Professor Buckland, Secretary of the Board, I called upon J. Delafield, Esq., of Geneva, New York, the gentleman who introduced the first efficient Tile Machine into that State, and obtained from him much useful information on that and other subjects. Mr Delafield† is President of the Agricultural College recently chartered by the New York State Legislature, which is about to commence its operations under most favorable auspices. In 1848 Mr. Delafield imported from England, at his own expense, one of Scragg's Tile Machines, and placed it in the hands of a Potter near Geneva, upon such terms as induced him to undertake the manufacture of drain tiles at a reasonable price. Mr. Delafield himself became a customer for a large quantity, and thus set an example to his neighbours. I saw this machine in operation, and was informed by the proprietor, that although attempts had been made to copy and improve it, yet he preferred the imported machine, and had ordered a new one to be constructed exactly like it.

The machine costs about £50, is very simple in its construction, and not liable to get out of order. The clay is the same as that ordinarily used by common potters, and is prepared by a Pug Mill in the usual way. It is then put into the machine, and by the motion of a crank, turned by one man, is forced through moulds, which give the desired shape to the tiles. With ordinary attendance about 3000 two inch pipe tiles are turned out daily. The machine is capable of producing a much larger quantity, but 3000 is the limit, as it is now worked. I visited a tile factory at Albany, in which a machine constructed on a different plan, (also imported from England) is used. But judging from the appearance of the tiles, and from the opinions of gentlemen who had taken an interest in the subject, I believe the machine at Waterloo, near Geneva, is to be preferred.

Professor Wilson gave me the names of the principal machines now used in England, and he mentions Scragg's as one of the best. I procured a cut of this machine, which will enable you to judge of its simplicity, &c.



The clay is put into the machine at *a*. After passing through a set of screens which remove all the small stones and gravel, it is subjected to the action of rol-

* Note.—At the late meeting of the Agricultural Association at Hamilton, a Mr. Charrock exhibited the model of a new machine, which he claims to have invented, but it has not yet been tested in Canada.

† I have heard with much regret, that this gentleman whose enterprise and intelligence placed him in the first rank of his profession, died shortly after my visit.

lers to give it a due consistence. It is then forced through the dies at *b*, and along the receiving table, *c*, which is composed of canvas placed on rollers so as to move with the tiles. The semi-circular wires descend at the proper moment, and cut the tiles to a uniform length. They are then carefully removed to drying shelves until ready for the kiln. Mr. Wartenbury, the manufacturer, informed me that the burning process was not more difficult than in the case of common pottery, but that some experience was necessary to prevent a large per centage of loss.

Before the introduction of this machine, Drain Tiles cost Mr. Delafield and others in Seneca county, from $20 to $25 per thousand. They are *now* produced for $9 per thousand. I obtained the following particulars of the expense of under draining, in the neighbourhood of Geneva, both before and after the introduction of the Tile Machine.

Before the Tile Machine was put in operation, the cost of thorough draining per acre, with drains 33 feet apart, which would require 91 rods of drain, was stated by Mr. Delafield, in an elaborate Report to the State Agricultural Society as follows :—

Tile, small size, 20 cents per rod.....	$18.20
Cutting trench, laying, &c., 18c.....	16.38
Cost per acre.....	$34.58

or about 38 cents per rod.

The cost of making a common stone drain, the stone being on the field to be drained, he stated as follows :—

Man and team per day, hauling enough for about five rods....	$1.50
Cost of laying at 6c. per rod.....	30
Cost of trench " 18c. "	90
Cost of 25 rods stone drain.....	$2.70

Or 54 cents per rod shewing a difference of 16 cents per rod in favor of the tiles, even when manufactured by hand. An acre with drains 33 feet apart, required about 1320 twelve inch (in length) tiles.

The present cost, Mr. Delafield informed me, is about 30 cents per rod; the tiles costing $9 per thousand at the manufactory. Mr. John Johnston, an intelligent Scotch farmer whose land adjoins Mr. Delafield's, has laid down upwards *of* 16 *miles* of tile drainage. He was the first to introduce the system practically into the State and it was at his suggestion and in consequence of his success, Mr. Delafield took up the subject with so much zeal and liberality. In 1851, Mr. Johnston presented a most interesting Report of his experiments to the State Agricultural Society; I shall copy a few sentences on the points of most importance.

Cost.

"I find that drains constructed with 2 inch tiles can be finished complete for 30 cents per rod. His farm is 5 miles distant from the tile factory."

Depth of Drain.

The rule adopted by one is first to select a good outlet for the water, then to dig a ditch so deep as to find a hard bottom on which to lay the tile. On my farm this is generally found at two and a half to three feet in depth.

Distance Apart.

The distance between the drains is regulated by the character of the soil ; if it is open or porous, drains three or four rods apart may drain it, while on tenacious soils two rods apart may be needed. Mr. Delafield expressed his opinion that Mr. Johnston had laid his drains unnecessarily close. He thought that about 4 rods was a proper distance on such soils as Mr. Johnston's and his own. This at 30 cents per rod would make the cost of drainage about $13.50 per acre.

Advantages.

About six years ago I began to drain a field on the boundary line between Mr. Delafield and myself. The field contained about 20 acres of which 6 were then subject to drainage. The 6 acres had seldom given a remunerative crop, even of grass. After draining the six acres, the whole field was ploughed and prepared for corn, two acres being reserved for potatoes.

The usual care was given to the cultivation of the whole crop, which during its growth showed a marked difference between the drained and the undrained portions of the field. The yield of this field proved to be the largest ever raised, I believe in the country ; the product being eighty three bushels and over per acre. This field attracted much attention from my neighbours, and others from more distant places ; it was examined at the time of draining, and after ploughing both the first and second seasons, the parties being able to walk on the drained parts without any undue moisture. While all the other land in the neighbourhood was muddy, and as before stated, the corn was found to be far more vigorous in the plant, and abundant in the grain.

In the following season I cropped it with barley, and found the drained land produced altogether the finest plant, and the best yield of grain. When the barley was harvested, I prepared the field and cropped it with wheat.

The difference again was so striking and distinct in favor of the drained land, that I felt the propriety of thoroughly draining the whole field, which was completed without loss of time, at a cost of twenty-two dollars per acre, for the whole field. I then ploughed and sowed with barley, and seeded with clover; of the latter I cut a very large crop last summer, and not one square foot of the clover froze out, and now I can rely on a good crop of any thing I may sow or plant. Encouraged by a considerable increase of product derived from draining, I determined to extend the system as rapidly as convenience and circumstances would permit." After detailing the results in other fields, he says : "I have forty acres of wheat now growing on thorough drained land. The improvements in my fields and crops have been great and satisfactory, giving me fine crops of wheat where formerly it froze out. So well satisfied am I of the advantages derived from the system, that I have drained six acres this fall, and shall continue to drain while I have a wet spot on my farm."

Reimbursement of Outlay.

Mr. Johnston gives some figures as to the cost of land, expense of draining, &c., and concludes with this important statement. "On such land as I have, if I get two crops of wheat from my drained land, I am paid by the excess of crop so as to cover all costs of draining, and sometimes more than paid by one crop, that is by the excess of crop beyond what it would have been had the land remained undrained."

I should observe that the land in question is a rich clay ridge. The soil of the locality rests upon a fossiliferous blue slate, called the Marcellus slate, which overlies the Seneca limestone. This slate is readily decomposed, and forms a tenacious clay. The soil of the country of Seneca generally, according to the State Survey, is a drift deposit.

The physical character of the diluvium, and the direction of the drift, lead to the inference that the soil is not derived from the wear or disintegration of the rocks that underlie it, but from the gypseous group which occupy the counties to the north and bordering Lake Ontario.

The Geological Survey of Upper Canada had, thus far, been too general and desultory, to afford much aid to the Agriculturist in determining accurately the origin and character of his soils ; but their similarity to those on which draining has been found profitable in the United States, may be assumed from qualities and characteristics sufficiently obvious for common apprehension.

In the Geological Report of 1850, the soil of Western Canada is spoken of in general terms as a deposit of loose detrital material, consisting of clay, sand, gravel, &c., which covers to a great depth the old strata, except in a few places.

Analysis have been made of the surface and subsoil of Upper Canada, taken from a few localities widely separated, but their practical value to the Agriculturist may be doubted, unless something more is done. The thorough and satisfactory manner in which the Geological Survey of the State of New York has been carried on, and the admitted practical advantages that have resulted from it to the intelligent Agriculturists of the State, induce me to recommend for your consideration whether it would not be more advantageous to the Province in every way to increase the scientific corps under the direction of Mr. Logan, so as to complete the Survey of the settled parts of Canada, within a much shorter period than will be practicable with his present force.

The subject seems to fall appropriately under your cognizance, as one of the means by which Agriculture may be largely aided.

It seems, moreover, a work which to be useful must be thorough, and therefore demands the generous help, and watchful supervision of the Government.

Ditching Machines.

There is still a great desideratum in the operation of thorough draining, viz: a machine that will rapidly and inexpensively open the trench to a proper depth. Fowler's Draining Plough, as exhibited at the great Exhibition of 1851, is an ingenious attempt to accomplish the object. This plough makes the orifice and deposits the tile at one operation, and without disturbing the soil. It leaves only a narrow slit in the earth as it passes along. A strong iron coulter with a plug large enough to open a space for the tiles, descends from a stout frame work placed on wheels, to the depth at which the tiles are to be laid, and is drawn from one side of the field to the other by a wire rope attached to a capstan. The tiles are threaded on a rope attached to the back of the plug. When the field is crossed the rope is detached from the plug, and withdrawn, leaving the tiles in the orifice it had made, which completes the drain.

The objections to this machine are obvious. 1st. The difficulty of keeping the plug at a proper incline, notwithstanding the irregularities of the surface. This is one of the points in which it is said to have been lately improved.

2nd. The liability to meet stones, or other obstructions in its course. This is an insuperable objection; and in Canada would I fear contract within very small limits the field of its operations. Every stoppage from such a cause would make it necessary to dig a hole in front of the plug, and remove the obstruction by hand, the horses and driver, &c., being in the meantime idle.

3rd. Liability of tiles to be broken. If a tile should split while being dragged along after the plug, it would leave the the rope, choke the passage, and perhaps stop the machine. How in such a case is the point of obstruction to be ascertained? The rope on which the tiles are threaded like a necklace, is three or four

feet under ground, and the distance from the side of the field where this necklace enters the earth may be 10 or 15 rods. As I have not seen the machine in operation, these observations are, of course, suggested by the *modus operandi*. Perhaps English tiles are strong enough to sustain the pressure, but those I examined at Waterloo, Albany, and New York, would hardly endure the strain of such a process.

4th. The expense of the machine, and the expense of working it:—I have not at hand the means of ascertaing the cost of Fowler's Draining Plough in England, but judging from the amount and character of its machinery, it could not, in this country, cost less than £100, or perhaps £150: Two horses and three men if not more, are required to work it.

This would place it beyond the reach of the ordinary farmer, though I apprehend the question of cost would be met as in other cases, if the other difficulties could be overcome. Parties would no doubt be found to undertake draining as a business, going from farm to farm.

A new ditching machine was exhibited at the Crystal Palace, but its merits were not very apparent. It was exhibited by a Mr Pratt of Canandaigua, New York, and will, he asserts, cut 150 rods of ditch, two feet deep, in a day; it is drawn by a single span of horses. As the foot and a-half or two feet of clay, which, the inventor of this machine does not profess to move, is at the bottom of the difficulty and constitutes four-fifths of the expense of cutting a proper ditch, I did not consider the machine worthy of being recommended to your notice.

A draining plough has lately been introduced into Scotland, which is highly spoken of for cutting shallow drains.

It is thus described by the correspondent of an American Journal.

In the first place, a common plough is passed back and forth, turning a furrow out on each side. Then follows the draining plough which goes down from two to two and a half feet; the mould board being so constructed as to turn the earth all out In this manner twelve acres in the vicinity of Stirling were drained with three ploughs in one day, the tile being laid in the furrow just as the plough left it.

The earth was returned to the ditch by means of a scraper in the form of the letter V, the legs of course protruding forward and a team attached to each leg on each side of the ditch.

A machine that will cut a narrow ditch to the depth of three and a half or four feet, cheaply and expeditiously, leaving the bottom at a proper incline independently of slight inequalities on the surface, and that will not be seriously obstructed by stones, roots, &c., is a great desideratum and when invented will be worth millions to Agriculture.

By reducing the cost of this operation, which lies at the foundation of successful farming, even one-third, you would ensure its general introduction, and no man can calculate the value and importance of the results that would follow. I therefore recommend the offer of a considerable sum, say two hundred or two hundred and fifty pounds, as a premium to the inventor of such a machine.

The Crystal Palace contained some new and many improved implements, and machines, of great practical value to the Agriculturist; but I discovered none, besides those already mentioned, that seemed to come within the scope of my instructions.

A number of reapers were exhibited possessing various features, some adapted to rough and light crops, others to the level prairies, and abundant harvest of the west. A self-raking apparatus attached to one of these excited much attention, and is certainly a most ingenious contrivance. The machinery by which the rake is operated is somewhat complicated, and therefore liable to derangement in unskilful hands. The inventor is a Mr. Aitkins of Chicago, Illinois. I recommend-

ed the proprietor to send a machine to the Provincial Exhibition, and gave him the necessary information for the purpose.

He promised to do so, and I had the pleasure of seeing it on the Hamilton fair ground. I have reason to believe that a considerable number of these reapers will be introduced into Upper Canada before the next harvest. In cases of this description government aid or interference is unnecessary. The enterprise of the manufacturer, or the necessities of the farmer, under the stimulus of high prices for labor and the products of labor induce him to search out and call to his aid, new labor saving machines, as soon as their utility is established. There were Threshing Machines, Fanning Mills, Grain Separators, Ploughs, Hay Presses, Straw Cutters, &c., and numerous other implements designed to facilitate the various operations of the farm, which well deserved the attention of the intelligent Agriculturist; but as I saw nothing to warrant me in recommending any of these machines or implements to the special notice of the Bureau, or Boards of Agriculture, "with a view of their introduction into this Province" at the public expense; and as I was not authorized or expected to Report on the Exhibition generally, I shall not offer any particular observations upon them All those of real utility are either already known to Canadian farmers, or soon will be through the medium of our annual Provincial Exhibitions.

Seeds, Vegetables, &c., &c.

Under this head, I beg to observe that by a friendly correspondence between the Bureau and Patent Office at Washington, and between our boards of Agriculture and the State Agricultural Societies, an interchange of seeds, &c., could be secured that would put us promptly in possession of every new variety or newly discovered product of the Vegetable Kingdom, that may be introduced into the United States. I did not feel myself at liberty to open a communication with the Patent Office on this subject, as it was beyond my instructions. Having made the suggestion, I leave the matter in your hands. The Secretary of the New York State Agricultural Society, B. P. Johnston, Esq., whom I met at the Crystal Palace, expressed great willingness on behalf of the Society to reciprocate in all such matters with our Boards. The State Society has established at Albany, an Agricultural Museum, which already contains a large collection of objects illustrative of the history, progress, and present condition of the art in that State.

It is open to the public and is daily visited by persons interested in Agriculture. Nearly all new inventions in Agricultural mechanics, that have stood the test of experiment, may be seen here, either in the shape of working models, or, as is generally the case, in the shape in which they left the hands of the manfacturer. Fruits, seeds, grains, vegetables, of every variety, are collected and labelled in such mode as may be practicable, preserved for exhibition. Mr. Johnston, who was present as the agent of the New York State at the World's Fair in London, brought from Europe on his return some forty varieties of wheat. These were distributed among the members of the Society in difierent parts of the State, for the purpose of being tested.

The results will be carefully noted. Mr. Johnston promised to collect and send to the Board of Agriculture, samples of those varieties which might prove to be valuable.

I may mention as a matter of some interest, and as indicating the probable advantages of the intercourse recommended, that Mr. Johnston received from a Rusian gentleman, whose acquaintance he formed when in London, seed of a new variety of flax It is represented to be a winter flax, and is expected to prove especially in the Northern States of great value. Its character and advantages are set forth as follows :—

1st. " It has the advantage to be sown in the fall ; not subject to be sown too early or too late, as this is often the case with the spring seed, and has always a failure of the crop in its train."

2nd. " The winter seed shoots sooner and before the weeds come out, which latter are kept back by it ; it is earlier ripe and can be brought in before the hands are wanted for other Agricultural operations."

3rd. " In order to prevent the shooting in the fall, the seed must be worked in by the plough as late as possible, and then the seed is not damaged, neither by 20 degrees of cold. (Reaumer.) In the spring, as soon as the field is dry, it must be lightly harrowed. It shoots with the first rays of the warm sun, and is already in flower when other spring seed is sown, and before the insects can do it any harm.

4th. " This seed is glossy, but dark and mixed with black grains ; yet all shoot.

It is a great deal more oily than the common seed."

The seed of this flax was to be tested this present winter, and if Mr. Johnson's expectations are realized it may be well worthy the attention of the Canadian flax sower.

At Rochester I procured and forwarded to Professor Buckland, 12 bushels of seed wheat, comprising the three varieties, of most repute in Genesee county.

This wheat has been sown on the expermental farm at Toronto.

Patent Laws.

During my examinations at the Crystal Palace, I came in contact with a number of American inventors, who complained loudly of our illiberality for inventions. They accused the Canadians of shortsightedness, as well as injustice, in not affording to American inventors encouragement and protection upon as favorable terms, at least, as those accorded to foreigners by their laws.

From the facts which came to my knowledge during these enquiries I am convinced, though formerly of a contrary opinion, that a change in our Patent Laws by which the inventors of valuable machines in the United States, could obtain the protection of a Patent in Canada for a short period, say 5 or 7 years, would be the means of readily introducing numerous American inventions, which under the present system are not introduced at all ; or only by individuals who, hearing of them by chance possess sufficient enterprise to become their own importers. It is now the interest of the American inventor to keep as far away as possible from the Canadian frontier. If the character of his machine is such, that it cannot be " pirated" manufactured in Canada, and clandestinely sold in the United States in violation of his patent ; the products of that machine may be imported in such quantities and at such prices as to reduce very much the value of his patent. Indeed, so common has this practice become in the case of wooden manufactures, that a bill was lately introduced, (and if my recollection serves me), passed by the New York Legislature, making contraband all manufactures proved to be the produce of Canadian copies of American inventions.

The difficulty of discrimination may prevent the effective operation of such a law, but the existence of a wrong which was felt is proved by the attempt to remedy it.

It was probably supposed that by leaving the whole field of American discovery open to all enterprise of our machinists and manufacturers, they would hasten to appropriate every thing valuable for reproduction at home.

But this expectation has not been realized. A considerable outlay is required to procure patterns, and make the necessary preparations for manufacturing heavy and valuable machines ; and when a man's next neighbour may set up in

the same business, and under-sell him the moment he has introduced and established the value of the articles, it is very plain that the enterprise is attended with some risk.

The consequence is, that Canadian manufacturers have not shown the alacrity that was expected in "pirating" American inventions. In the case of cheap machines or implements adapted to common use, the evil is not so great; though even in regard to this class, I believe their introduction would be much facilitated by holding out inducements to the inventors to occupy the field himself.

All foreigners are excluded from the benefit of our Patent Laws, while "any person a subject of Her Majesty, and resident in this Province," may avail himself of their protection, not only for his own inventions, but for such as he "may have discovered or obtained a knowledge of" in foreign countries, except the "United States and Her Majesty's dominions."

A Canadian may obtain a patent in the United States upon the same terms as a citizen, except that he must pay a somewhat higher fee. So may an American obtain a patent in England.

Why should we be less liberal? To profess a desire for "Reciprocity," while our patent laws are a standing proof of hostility to the principle, will not add to our reputation for consistency or honesty.

If, therefore, these laws expose us to the charge of inconsistency; if they display less international liberality than the patent laws of any other civilized country, if their effect be not to promote the prompt and general introduction of important new inventions, but to obstruct and delay their introduction, it seems to me that no time should be lost in revising them.

I strongly recommend the subject to your notice, in the hope you will agree with me in thinking that it demands the attention of the Legislature.

I beg to conclude this report, the result of a short mission of twelve days, with the following *resumé*:—

1st. I recommend the abandonment of the idea which seems to have been entertained by your predecessor, if it be entertained by you, that the Minister and Boards of Agriculture should undertake the importation directly of animals, implements, or machines, except in those rare cases in which private enterprise has been found wholly inadequate; and in these rare cases, I apprehend the offer of premiums, provided they are sufficiently liberal, will be found the cheapest and most efficient means to achieve the desired result.

2nd. I recommend the abandonment of any special inducements, or agencies, that may have been proposed or adopted, with the view of turning the attention of farmers in Upper Canada, from their present crops to that of flax. I offer no opinion upon the propriety of special Governmental inducements in Lower Canada.

The offer of premiums, (say £100 each,) through the boards of Agriculture, for the introduction and establishment in Upper and Lower Canada, respectively, of a complete set of flax machinery, might lead to beneficial results; I therefore recommend the offer of such premiums.

3rd. I recommend that a sufficient sum be placed at the disposal of the Board of Agriculture, to enable it to secure either by offering a sufficient premium, or by entering into a conditional agreement with some practical potter in the vicinity of Toronto, the immediate importation of Scragg's Tile Machine. The same aid should be extended to the Board for Lower Canada. Should it turn out that the machine of Mr. Charrack is capable of producing good tiles with rapidity, and at small expense, importation will of course be superseded. I may observe that numerous "improved" Tile Machines have been presented to the public in England within the last few years, but Scragg's, Clayton's, and Whitehead's appear to have maintained their supremacy.

4th. I recommend the offer of a liberal premium for the invention, or introduction of a Ditching Machine, the conditions being prescribed by the Board of Agriculture.

5th. I recommend that measures be taken to make the Geological Survey, immediately useful to the Agricultural interests of the Province A better digested and more systematic arrangement of materials explained by diagrams, maps, &c, upon the plan of the State Survey of New York, is what seems to be wanted.

6th. I recommend that an immediate grant of £400 or £500 be made to each of the Boards of Agriculture, in order that they may begin the collection of materials to form the Agricultural Museums, contemplated by the Act 16th Vic. cap. 2, sec 16. I am not aware that any step has yet been taken to establish these museums, owing I presume to a want of means by the Boards. The manufacturers of implements, would in most cases supply samples gratuitously as they would be repaid by the publicity thus secured. The collection of grains, seeds, &c., and the testing of their qualities under the direction of the Boards, would be productive of important results. No one can visit the Museum at Albany without perceiving at once its great utility.

7th. I recommend an amendment of the Patent Laws, so that foreign inventors may obtain a limited protection in Canada on complying with certain conditions ; one of which should be the establishment of a manufactory, or depot in the Province, where the invention could be purchased.

There are many other points, some of them of as much importance to the cause of Agricultural improvements as any I have mentioned, which I should have been glad to submit for your consideration, but they do not come strictly within the scope of Mr. Cameron's letter. The Experimental Farm at Toronto is in an unsatisfactory state for want of means, and from uncertainty as to the ultimate disposition of the University grounds which have been assigned for the purpose.

Unless more decisive and thorough measures are speedily adopted, the whole project will miscarry, and not the least of the evils to be apprehended from its failure is the prejudice it will excite in the public mind against all scientific demonstration in the art of Agriculture.

Having taken a deep interest in the organization of the Bureau and Boards of Agriculture, and having been honored by your predecessor with frequent consultations in the preparation of the Agricultural Act, I have felt the more freedom in offering suggestions and recommendations as to general conduct and principles, rather than specific actions.

Without attempting to enumerate the various implements, &c., that I consider adapted to Canada, I have endeavored to ascertain what action by your department and the Boards of Agriculture in promoting their introduction into this Province would be likely to ensure success and to point it out.

I have the honor to remain
Your humble servant,

WILLIAM McDOUGALL.

Toronto, December, 1853.

SECOND ANNUAL REPORT

OF THE

BOARD OF AGRICULTURE.

OF

UPPER CANADA.

1853-4.

To the Hon. John Rolph,
Minister of Agriculture,
&c., &c., &c.

Sir,—The Board of Agriculture of Upper Canada, established by Statute 13 & 14 Vic., cap. 73, have the honor of submitting to you a Report of their proceedings.

Since the date of their first Report,—September 1852,—the Board have held seven meetings; two were convened in the City of Hamilton, and had more immediate reference to the making of the usual arrangements for holding the Provincial Exhibition, which took place in that City in the Autumn of last year.—The numerous points of detail which necessarily occupy a large share of the time and attention of the Board at each of its sittin s, being generally of a nature not necessary to be enumerated in a Report, it will be more convenient to narrate their proceedings, under the following departments :—

PROVINCIAL AGRICULTURAL ASSOCIATION.

This important institution having been placed by the existing Agricultural Statute principality under the direction of the Board, they have accordingly devoted to its management, a large share of their time and attention. It has afforded them great satisfaction and encouragement to witness the steady progress which the Association has made almost from the commencement, while the last two Exhibitions have far outstripped any of their predecessors, and fully realised the highest anticipations of the warmest and most hopeful friends of the Society.

The Exhibition being held in a different part of the Province each year, its character and extent will necessarily more or less vary according to the Agricultural and industrial state and capability of the district, and the facilities afforded for reaching the scene of competition. Railroads are beginning to impart important aid in this respect; and when the principal lines now in progress shall be

completed, there will no doubt be a much larger amount, both of articles and visitors, at their yearly gatherings.

	Toronto, 1852.	Hamilton, 1853.	Increase.	Decrease.
Durham Cattle	81	88	7	
Devons	30	53	23	
Herefords	5	5		
Ayrshires	21	46	25	
Grades	33	48	15	
Fat Cattle and Working Oxen	21	18		3
Blood Horses	16	46	30	
Agricultural Horses	212	170		42
Leicester Sheep	79	139	60	
Southdown Sheep	39	48	9	
Merinos and Saxon Sheep	33	35	2	
Fat Sheep	18	13		5
Pigs—large breed	33	28		5
Pigs—small breed	15	27	12	
Poultry	57	50		7
Agricultural Productions	336	319		17
Horticultural Productions	482	525	43	
Agricultural Implements	136	145	9	
Dairy Products, &c.	82	102	20	
Domestic Manufactures	115	104		11
Manufactures in Metal, &c.,	53	99	46	
Cabinet Ware, Carriages, &c.,	29	65	36	
Woollen and Flax Goods	56	65	9	
Ladies' Department	229	266	37	
Fine Arts, &c.,	201	182		19
Book Binding, &c,	30	6		24
Indian Prizes	3	13	10	
Pottery, &c.	12	9		3
Foreign Department	72	90	18	
	2529	2804	412	136
*Extra Classes	523			523
Totals	3052	2804	411	659
Total Decrease				248

*Articles not in the Prize list were not entered separately at Hamilton, as at Toronto, which explains the above. The gross decrease at Hamilton augurs no falling off in the Institution, rather the reverse, Toronto being the centre of a much greater population.

The Board has been desirous of keeping up the prize list on a scale in accordance with the progressive tendencies of the Society and the Province, and accordingly both the number and value of the premiums have received annually a considerable increase. This healthful line of progress it is believed will be found constant, and from a larger revenue derived from an increased number of members and visitors at the shows, with the continuance to the Board of the usual Parliamentary grant, there can be no reasonable grounds for doubting that the resources of the Association will continue to be found fully adequate to meet its annually increasing expenditure.

Whilst treating on the income of the Association, it is proper to mention the munificant donations of the two last Presidents, T. C. Street, Esq., M. P. P., and William Matthie, Esq., the former gave a prize of £30 at the Exhibition in 1852, for the best stallion for general purposes, specially adapted to the wants of Canada. The show of Horses at the Exhibition held in Toronto in the autumn of that year, was far beyond anything ever witnessed in the Province, both as to extent and excellence, and reflected great credit on the breeders and exhibitors. Mr. Street also gave a prize of the value of £20, at the last Exhibition in Hamilton for the same object; and doubtless this liberal act has been already productive

of beneficial results. Mr. Matthie contributed the handsome sum of £50, for various special prizes for agricultural and dairy products at the last Exhibition, including one for the best essay written by a practical farmer, under 25 years of age, on the dignity of agricultural labor, which was won by Mr. Thomas McMicking of Queenston. A balance of £6 10s. remaining unappropriated, the donor directed it to be given in books to the student, of the Agricultural class in University College, who should pass the best examination at the close of the session, an honor obtained by Mr. J. E. Sanderson, a junior sophister, and the son of a farmer. The Board, in expressing deep regret on account of Mr. Matthie's impaired state of health during the latter period of his Presidency, a circumstance which deprived them in some measure of the benefit of his personal services, and bearing willing testimony to his enlightened zeal and patriotism, now rejoice in being assured of his recovery. The prompt manner in which Mr. Sheriff Treadwell, the then Vice-President of the Association, came forward and supplied the place of the President, is deserving of special commendation.

It may be proper, however, to remind the Association that while such donations as before mentioned must be ever thankfully acknowledged, they are not necessarily to be considered as precedents binding on the President of this year. Much gratitude will be readily awarded for like munificent donations, but it is sufficiently obvious that in the progress of the Association, such exertions are not to be reckoned from gentlemen called to discharge the annual duties of President.

The board also record with gratitude and pleasure the continued liberal support of the Association by the Canada Company. From the commencement of the Society, the Company's annual prize of £25 for the best 25 bushels of Wheat has called forth extensive competition; and the gratuitous distribution of the Wheat among the different Counties for seed, cannot have failed of producing the most beneficial effects. The show of wheat in particular, at each annual Exhibition has been marked by distinguished superiority; a circumstance to be ascribed in great measure to this munificent prize. The Canada Company have likewise given, the two last years, liberal premiums for the encouragement of the growth and preparation of Flax and Hemp. They also sent from England to the Exhibition held in Toronto in 1852. *Donlan's Flax Machine*, which, by the kind consideration of Mr. Commissioner Widder, has been presented to the board, with several copies of the best modern treatise on the cultivation and preparation of flax. As that article is now rapidly rising in value, and the climate and soil of Canada being well adapted to its growth, there is good reason to hope that the generous encouragement afforded by the Company, and the laudible desire felt by the Government to promote the object, as evinced by having lately sent a deputation to Great Britain and Ireland for the purpose of procuring the latest and most reliable information on the subject, will be eventually crowned by a large measure of success.

The last two Exhibitions held at Toronto and Hamilton, respectively, were attended by a vast concourse of visitors; and not only were the stock and articles for competition much larger in amount than at previous shows, but several new things were introduced and the general quality of the whole was of a higher character than heretofore. In implements and machinery, a very marked improvement was obvious, and in the varied productions adapted to a northern climate it is believed that the Exhibitions of the Upper Canada Association are not excelled by any on this Continent.

A very interesting collection of School apparatus, maps, models, &c., furnished by the Chief Superintendent of Education, formed an instructive part of the Toronto Exhibition, and, in that at Hamilton, was shown an extensive assortment of grains, vegetables, &c., of very superior quality, raised on the experimental grounds belonging to the Provincial Normal School, which attracted much atten-

tion and reflected great credit on the skill and attention of Mr. Mundie, the superintendent of the grounds.

It will thus be seen that the Provincial Association has a wide field for operation embracing not only the pursuits of Agriculture and Horticulture, but to a considerable extent those of Education also, whilst the Mechanical and Manufacturing arts receive a large share of attention and encouragement. It has been a principal object with the Board to conduct the affairs of the Association on economical principles, so as to distribute as large a sum as possible in the form of prizes. An extensive and liberal prize list must necessarily form the chief element of success and permanency to all Societies of this nature. As the place of Exhibition is changed annually, the expense for fencing, building &c., must always amount to a large sum. The Board, however, hopes to be able to provide before long, more convenient and securer accommodation, without exceeding the usual outlay for such purposes.

AGRICULTURAL SOCIETIES.

Since the passing of the present Agricultural Statute,—16 Vic., cap 11,—in 1852, the number of Societies organised for the purpose of promoting the interests of Agriculture has considerably increased. Counties judicially united have all, with but one exception, availed themselves of the privileges of the Act, and have formed distinct Societies. This circumstance is no doubt advantageous upon the whole, as it cuts off the source of sectional jealousy, and enables each county to concentrate its energies in promoting its own Agricultural advancement. Two or three cases, apparently exceptions, have come to the knowledge of the Board, but even these it is believed will shortly participate in the general benefit arising from this principle of the Act. There have been during the past year a very few cases of difficulty in distributing the Parliamentary Grant among County and Township Societies, arising out of peculiar circumstances which the most far-seeing and minute legislation could not effectually provide against. A few complaints have also reached the Board against that clause of the statute which appoints the Exhibition of the County Society to be held in the County Town, unless conditions are agreed upon, which are not likely to meet general assent. This and a few other minor matters might be advantageously revised hereafter.

Upon the whole, the present Agricultural Statute has worked satisfactorily and beneficially, and must be regarded as a judicious and valuable piece of legislation. It is based on the important principle of a mutual relation in an ascending order, between the Township and County Societies, and further with the Provincial Board and Association, and ultimately with the Bureau of Agriculture; thus recognising in a manner, the most distinct and natural, the Agricultural interest of the Province,—which forms the basis of all others, by the Executive Governments.

Not only has the number of Societies increased during the past year, but it is obvious that their administration has been improved, and as a consequence their benefit to the Agriculture of the Country must have been augmented. The Reports for 1853, which have just been sent in to the Board, are, upon the whole, more full, definite and instructive, than those of the preceding year, although the latter it is believed were much superior to any thing that had been attempted previous to the passing of the present Agricultural Statute. The Societies generally have been quite punctual in complying with the conditions of the law; and the few irregularities that have occurred may be traced to accident or over-sight, or the misapprehension of the conditions which the statute requires.

The Board, however, while feeling a pride and pleasure in bearing testimony to the efficacy and beneficial influence of our already numerous Agricultural Societies, desire to guard against any interpretation of their language that might even

imply an idea that these important instrumentalities admit of or require no change or improvement. A wider and more promising field is opening for their occupation than has ever been presented in the history of the Province, and they must adapt themselves accordingly to meet the new and increasing demands which will continue to be made upon them.

One of the most natural and important results emenating from these Societies is the formation of Farmers' Clubs, several of which have been recently established in Upper Canada, and are now in successful operation. The essays which have been read before these clubs, and the discussions to which they have given rise, have been published in the Agricultural Journal and other papers; and it is not too much to say that their proceedings will not compare unfavorably with those similar Societies either at home or in the United States.

PRIZE ESSAYS AND REPORTS.

The Board has much satisfaction in observing the improvement which is making in the Province, in what may be termed a native Agricultural literature. The offering of premiums for the reports on the farming and industrial condition and capabilities of Counties, commenced two years since, promises to be attended with no small benefits. This practice has been pursued by the Royal Agricultural Society of England with marked success, and from the limited experience of it here, there is reason to anticipate similar beneficial results. It calls forth the latent talent of our rural population; awakens a spirit of enquiry and rivalry; present the latest and most reliable information relative to the soil, modes of cultivation, productions and general industrial condition and capabilities of each county; a proceeding which cannot fail to awaken attention, wherever these reports are read, to the great natural resources of this rapidly improving section of the British Empire.

Hithereto the few essays and reports obtained by the Board, with a condensed statement of their proceedings and other official matters have been published in the Canadian Agriculturist, a monthly Journal, issued in Toronto at a very low price to Agricultural Societies. For this privilege the Board have given the proprietor a small consideration. The materials, however, having of late so much increased, as to render their publication in the Agriculturist impracticable, or at least exceedingly inconvenient, it is hoped that Parliament, in its wisdom and liberality, will consent to the publication of these reports with the proceedings of the Board. It is but just, however, to the Proprietor of the Agriculturist,—who has done much for the promotion of the cause and sustained a pecuniary loss in carrying on that paper in its earlier years, to say, that that Journal is still open to the Board for the gratuitous publication of such portions of its proceedings, and for communicating such information to Societies and the public as would not conveniently admit of delay. The Board is of opinion that the encouragement of properly conducted Agricultural periodicals by farmers themselves, is a duty of first importance, and that it would be attended by the happiest results. It is much to be desired that the Canadian Agriculturist, while affording an adequate return to the Proprietor, should be made as extensively as possible the vehicle of thought and information among the great body of our rural population.

LIBRARY AND MUSEUM.

The nucleus of a valuable Agricultural Library has already been formed. Most of the books have been purchased, but several volumes and a few plates and diagrams have been presented by individuals who feel an interest in promoting the objects for which the Board of Agriculture was established. It is desirable to increase the library progressively, so as ultimately to comprise all the best publications extant on Agriculutre and the cognate arts.

The Board has not lost sight of what is recommended by the Statute under which they act, in reference to a Museum of Agricultural implements and productions. A commencement has been made and it is confidently hoped that the object will be more rapidly advanced as soon as the experimental farm shall be in full operation.

EXPERIMENTAL FARM.

Several delays have been experienced in carrying out that provision of the Agricultural Act, relative to the establishment of an Experimental Farm by the Board of Agriculture. Considerable improvements have already been made by way of clearing, levelling, &c., of a portion of the University Grounds which the Senate appropriated for such purposes. But in consequence of changes which have subsequently occurred, or are now in contemplation, it is found that the whole of the space originally intended for the experimental farm—50 acres—cannot be spared for that purpose, and the Board have accordingly resolved to restrict their operations within narrower limits; and they are now proceeding with the completion of the work with all practicable speed.

Although the extent of land really available for this purpose is necessarily more restricted than was originally intended, yet sufficient space it is believed will be secured for purely educational and experimental purposes. It is of much importance that a piece of ground be set apart as near to University College as is practicable, when the Professor of Agriculture can illustrate his teaching in the lecture room by practical operation in the field, and carry on a series of experiments with new and improved varieties of plants, and the various substances used as manures, with reference both to the requirements of scientific instruction and the working out of practical and beneficial results. In their next report the Board indulge the confident hope of being able to record that the Experimental Farm has been brought into full and successful operation.

They also desire to express their satisfaction with the recent appointments to the new chairs in University College, particularly as two out of the four,—those of Geology and Natural History,—have a direct and important bearing on the progress of an improved system of Agriculture. It is much to be desired that the youth of the country will, as far as possible, avail themselves of these advantages.

The Board have heard with much pleasure that the formation of a Botanic Garden in connection with the University is likely to be proceeded with. Such a garden in juxtaposition with the Experimental Farm will be mutually advantageous, and highly interesting and instructive.

The Board had hoped to announce before the conclusion of their Report the adjudication of His Excellency's Prize for the best drainage-pipe machine, first put into operation in Canada. Two machines have been reported for competition and it is expected that a decision will shortly be made. The importance of introducing the best constructed machines for the manufacture of draining materials into this Province is really incalculable, and cannot fail to be appreciated by all who have at heart its material advancement. It is universally conceded that draining in all climates similar to our own forms the basis of every sound system of agricultural improvement.

The question of importing pure bred cattle has occupied more or less the attention of the Board at each of its sittings; and several communications have been received from intelligent and enterprising individuals strongly urging the practicability and great advantages of the project. From the best attention they have been able to give the subject, the difficulties which would most likely attend any direct attempt of the Board engaging in such a business, have always appeared, if not insuperable, at least very great and discouraging; and it might probably be urged that they were improperly interfering with business of private indi-

viduals. It has been deemed therefore expedient for the present to await further information ; some organised plan for the safer and cheaper mode of importing stock in larger quantities than can probably be done by mere private enterprise may hereafter be devised. In the mean time the Board has determined to offer as much encouragement to this object as the funds at their disposal will admit, through the medium of the Provincial Association. With this view larger premiums have this year been announced ; and in all cases of male animals in the different departments, obtaining a first premium, it has been determined to double the amount in case of all animals imported since the last exhibition.

As heavy expenses, and but too frequently serious losses, are incurred by importing live-stock from beyond the Atlantic in the ordinary way, the Board would most respectfully and earnestly urge upon the attention of the Minister of Agriculture and the Government, the desirableness and importance of making such arrangements as may be practicable with the Canadian line of Atlantic steamers, for facilitating these operations, both as regards a diminution of charges and more particularly as regards better accommodation and greater security to animals during the passage.

As soon as it was ascertained that the government was willing to grant pecuniary aid towards procuring and transporting suitable productions of the Province to the Sydenham Crystal Palace, near London, a circular was prepared and issued by the President of the Board to all the County Agricultural Societies, inviting their co-operation. Several replies have been already received, all favorable to the object. But it unfortunately happens that the period of the year is not favorable for the procuring of superior specimens of grain and raw produce ; and it is obvious that some time will be required, and probably a more efficient instrumentality employed before much will be accomplished. It is believed, however, that ultimately such a collection of Canadian productions will be procured, and forwarded to England, as will fully sustain the high reputation which this Province won at a former Exhibition in the mother Country, of a similar character.

Appended, are Balance Sheets of accounts of the Board and Local Committee for the year ending August. 1853.

All of which is most respectfully submitted.

E. W. THOMSON
President B., A., C. W.

R. L. Denison, Treasurer, in Account with the Provincial Agricultural Association of Upper Canada, 1852-'53.

1852.		£	s.	d.
Sept. 13...	To Balance from Account of 1851-'52, as per Audit...	175	15	7½
" "	To Grant from County of Middlesex.....	25	0	0
" "	" " Canada Company, per Mr. Widder....	35	0	0
" "	" " Prince Edward County Society.....	20	0	0
" "	Donation from John Scarlett, Esq.....	1	0	0
" "	Grant from Frontenac, Lenox and Addington United Counties' Society.....	25	0	0
" 21...	Northumberland County Society	12	10	0
" "	Oxford do do.	20	0	0
" 22...	Nine Life Members' subscriptions	22	10	0
" "	Grant from Norfolk County Agricultural Society.....	20	0	0
" 29...	Badges to 1305 Members, at 5s.....	325	5	0
" "	25,103 Tickets to Show Grounds, 7¼d. each.....	784	9	4½
" "	Grant from Wentworth and Halton.....	12	10	0
Nov. 15...	" " Goderich.....	10	0	0
Dec. 31...	Grant from Government.....	1000	0	0
1853.				
Feb. 11...	Grant from County of York.....	124	7	6
	£	2613	7	6

1853.		£	s.	d.
April 23...	Fuel, Repairs, &c. for Office, to date.....	10	7	10½
" "	Treasurer's Salary	50	0	0
May 14 ...	Paid G. T. Denison, Esq., for use of Offices	7	10	0
May 21:...	Paid for Horses, for Experimental Farm	45	2	5
June ...	Cab Fare and Expenses of Board, Hamilton.....	4	11	0
"	Grant to Local Committee at Hamilton	25	0	0
July 20...	Professor Buckland, Salary as Secretary	50	0	0
" "	Books, &c., for Library, to date	19	18	5
" "	1000 Copies Canadian Institute Journal, containing Illustrations of Exhibition at Toronto, for distribution, as per Order of Board.....	30	0	0
" 26...	Wagon, Implements, Harness, &c., for Farm	40	13	6
" "	Expenditure for Labor, &c., on Farm, to date	95	8	9
" "	Paid Wm. McDougall, for Printing Transactions.....	150	0	0
Aug. 4...	Postage, Telegraphs, &c., to date	13	17	9½
" "	Furniture, &c., for Office	18	18	0
" 8...	Salary Assistant Secretary.....	47	5	0
" "	Printing, Stationery, &c.....	34	4	8
" "	Members of Board, Allowance for Expenses, &c., to date.....	130	6	6
	Amount of Premiums paid for the year.....	1236	19	0
	Total Expenditure ..... £	2009	2	11
	Balance	604	4	7
	£	2613	7	6

To Balance carried to Account of 1853-'54, as per Audit.....£ 604 4 7

Auditors. { G. P. RIDOUT, Esq., M. P. P.,
E. W. THOMPSON, Esq.,
GEORGE BUCKLAND, Esq.

PROVINCIAL AGRICULTURAL ASSOCIATION OF UPPER CANADA.

R. L. Denison, Treasurer, in Account with the Local Committee at Toronto, 1852.

1852.		£	s.	d.	1852.		£	s.	d.
	To Grant from York County Council	100	0	0		By Payment of Sundry Accounts for Stationery, Printing, Books, Posting Bills, Material used in the Construction and Decoration of Buildings and Fences, &c	105	3	7½
	" " City of Toronto	200	0	0		By Payment of Contract for Buildings, Fences, &c	378	0	0
	To City of Toronto Debentures, being 2nd grant	600	0	0		By Hay, Straw, Bran, &c., for Stock, during Show	16	1	3
	To Grant from Provincial Insurance Co	12	10	0		By Paid Workmen employed in Decoration of Buildings and Grounds, &c	55	1	10½
	To Grant from Storey & Co., Contractors O. S. H. R. R.	12	10	0		By Paid Gate-Keepers, Night-Watch, and other men in charge of Buildings and Property, during the Show	52	19	4½
	To Rent of Booths and Stables	67	15	0		By Paid Assistant Clerks for Secretary and Treasurers' Offices, during Show	36	10	0
	To Proceeds of Sale of various articles used in construction and decoration of Buildings, Fences, &c., and of other articles left on hands of the Committee	31	5	5		By Payment of Police Constables	27	15	0
						" " City Brass Band	12	10	0
						By Tinsmith and Plumber's Work	14	3	2½
						By Cartage, Horse and Cab Hire, &c	7	18	9
						Workmen and Materials fitting up Floral Hall, &c	31	18	4
						Assistant Secretary	10	0	0
						Breakfast for Judges and Officers on the Grounds	18	18	6
						Compensation to Mrs. Burns for Assistance on Ladies' Committee	3	0	0
						Amount Paid to Rev. Mr. Geddes, as a Discretionary Award for Embroidered Carpet, shown by Ladies of Hamilton	5	0	0
						Discount on City Debentures	36	10	0
						Paid for Refreshment Tickets	35	15	0½
						Wm. McDougall, Account for Printing	63	14	6
						Other Accounts for Printing	3	14	11½
						Miscellaneous Charges and Expenses, Gold Medal, &c	16	6	3
						Secretary and Treasurer	37	10	0
						Total Expenditure	968	10	8
						Balance Carried to General Account	55	9	9
	Total Receipts £	1024	0	5		£	1024	0	5

Balance Carried to General Fund of Provincial Association, as per Audit £ 55 9 9

Auditors. HENRY CROFT, Esq., WALTER McKENZIE, Esq.

ABSTRACT LIST of the County Agricultural Societies, Amount of Subscriptions, and Amount of Government Grant, the year 1853

County Societies.	Subscriptions, 1853	Amount of Government grant, 1853.
Addington.	£ 45 10 0	£136 10 0
Brant.	72 1 9	216 5 3
Bruce.	25 11 3	76 13 9
Carleton.	137 10 0	250 0 0
Dundas.	41 5 0	123 15 0
Durham.	155 2 6	150 0 0
Elgin.	109 5 0	150 0 0
Essex	84 5 0	150 0 0
Frontenac.	103 10 0	150 0 0
Glengarry.	75 17 6	150 0 0
Grey	37 0 0	111 0 0
Haldimand.	111 15 0	250 0 0
Halton.	72 15 0	150 0 0
Hastings.	111 0 0	250 0 0
Huron	84 15 0	150 0 0
Kent.	147 5 0	250 0 0
Lambton	110 10 0	150 0 0
Lanark.	162 16 6	150 0 0
Leeds and Grenville.	115 16 3	250 0 0
Lenox.	47 15 0	143 5 0
Lincoln	69 10 0	150 0 0
Middlesex.	210 15 0	150 0 0
Norfolk.	104 10 0	250 0 0
Northumberland	155 15 0	150 0 0
Ontario.	200 3 9	150 0 0
Oxford	286 6 0	250 0 0
Peel.	104 6 3	150 0 0
Perth.	98 0 0	250 0 0
Peterborough	132 10 0	150 0 0
Prescott	52 0 0	150 0 0
Prince Edward	98 15 0	250 0 0
Renfrew	25 0 0	75 0 0
Russell	52 10 0	150 0 0
Simcoe	153 13 1½	250 0 0
Stormont	61 15 0	150 0 0
Victoria	77 12 6	150 0 0
Waterloo	111 7 6	250 0 0
Welland	125 0 0	150 0 0
Wellington.	231 0 0	250 0 0
Wentworth.	116 15 0	150 0 0
York.	191 11 0	150 0 0

FIRST ANNUAL REPORT

OF THE

BOARD OF AGRICULTURE

OF

LOWER CANADA.

To the Honorable John Rolph, Minister of Agriculture, &c., &c.,

The Board of Agriculture of Lower Canada, established by Act 16 Vic., chap. 11, have the honor to submit a brief Report of their proceedings.

The first meeting of the Board was called in the City of Montreal, by the Minister of Agriculture, the Hon. Malcolm Cameron, on the 27th day of March, 1853, and on that occasion two days were spent in deliberation. Four meetings have been subsequently held, viz.:—on the 3d and 4th of May, the 6th and 7th of September, the 26th of the same month to the 1st of October inclusive, and the 2nd and 3rd of December, 1853.

At the first meeting of the Board, Reports were received of the legal organization of 33 County Agricultural Societies, and memorials were presented from 30 Sections of Counties, in conformity with the 11th Section of the Act 16 Vic. chap. 18, for the authority of the Board to organize Section Agricultural Societies, of which 21 were acceded to and approved, and 9 refused for that year.

There are now organized and in full operation in Lower Canada, 53 Agricultural Societies, having 7,123 members, who have paid their subscriptions in the past year, to the amount of £2,711 currency, and who have been paid the Legislative allowance to which each was entitled, and amounting to £6,369 currency, exclusive of 10 per cent retained for the Agricultural Association of Lower Canada, amounting to £708 currency.

The Board being constituted by the Act 16 Vic. chap. 11, the Council of the Agricultural Association of Lower Canada, and the Association not having been organized previous to holding the Provincial Exhibition, which took place at Montreal in September last, it devolved upon the Board to prepare and arrange a list of premiums for the Exhibition, with suitable rules and conditions for competition and adjudication and for the general management of the Exhibition. They had also to disposeof various other details of business connected with the Exhibition, which occupied their attention for a considerable time, but which would not be interesting to introduce into a Report of this nature.

In order to assist the Board in carrying out the Exhibition, they appointed a Local Committee, who rendered very efficient service previous to and during the Exhibition.

The Board, sensible of the necessity of providing suitable accommodation for exhibitors, so that their live stock and their products of agriculture and industry should not be exposed to injury while remaining upon the showground, adopted the English plan on similar occasions of covered sheds for the horses

and neat cattle, boarded pens for the sheep and pigs, and suitable buildings and tents for the products exhibited, a most fortunate circumstance, and materially conducive to the success of the Exhibition, as the weather proved extremely unfavorable the two first days, and although the providing this accommodation greatly augmented the expenses of the Exhibition, it was amply compensated by the shelter afforded to the live stock, &c., and by admitting of the proper arranging of the animals in their respective sections and classes, so as to enable the Judges to perform their duties satisfactorily, and make correct awards of the prizes according to comparative merit.

From a variety of causes incident to a first effort to hold an agricultural Exhibition in Lower Canada, worthy of that section of the Province, the expenses were unavoidably large, but the Board had the satisfaction to see by the results of the Exhibition, that their object was completely attained, and the whole amount expended was as nothing, when compared to the vast amount of benefit to the country generally, in bringing together from Upper and Lower Canada numerous and excellent specimens of every variety of live stock, of the products of the dairy and field, the garden and orchard, and the various manufactures of Canada, and also a very numerous assembly of people of all classes, and of many countries, to see, compare and admire all that was exhibited.

The following summary will afford some idea of this interesting Exhibition. In the Industrial Department, the Board are unable to state the exact number or amount of premiums awarded in each section, and can only state the whole amount paid in prizes in that Department of the Exhibition.

Provincial Exhibition—Agricultural Department.

Sections.	Denomination.	No. of Entries.	No. of Prizes Offered.	Amount of Prizes Offered.	No. of Prizes Awarded.	Amount of Prizes Awarded.
				£ s. d.		£ s. d.
A	Durhams	95	40	92 0 0	32	74 5 0
B	Devons...	25	24	56 10 0	11	26 10 0
C	Ayrshire	119	40	90 11 0	38	87 0 0
D	Canadian or Alderney	88	43	93 5 0	29	76 0 0
E	Grade Cattle	88	38	66 10 0	34	62 15 0
F	Best 3 Cows of any age or breed ...	7	3	13 0 0	3	13 0 0
G	Fat Cattle	8	6	12 0 0	4	9 0 0
H	Working Oxen	22	6	12 0 0	3	6 0 0
I	Leicester Sheep	121	30	48 10 0	29	48 0 0
K	South Downs	11	18	32 10 0	4	10 15 0
L	Merinos and Saxons..	9	18	31 5 0	1	3 0 0
M	Other Breeds	44	20	34 0 0	18	32 15 0
N	Fat Sheep	10	6	12 0 0	6	12 0 0
O	Swine, large	53	14	35 0 0	14	35 0 0
P	Swine, small	44	14	35 0 0	14	35 0 0
Q	Horses, Draught	237	33	92 0 0	27	80 0 0
R	Horses, Blood...	19	15	46 10 0	4	11 10 0
S	Dairy Produce	137	12	18 0 0	9	13 0 0
T	Field Produce...	416	101	90 5 0	80	73 15 0
U	Sugar, Maple	20	6	6 0 0	6	6 0 0
W... ...	Implements	66	124	142 15 0	36	53 0 0
X	Foreign Stock	2	36	64 0 0	1	3 0 0
	Foreign Implements	1	16	26 5 0	... ...	... ...
	Governor General—Prize Horses ...	6	1	20 0 0	1	20 0 0
	Land Company— do ...	34	5	25 0 0	4	15 0 0
	Major Campbell—Best Treatise on Agriculture, in French, with Conditions	... ...	1	25 0 0	Not yet decided.	
	Extra Stock	41	No Prizes paid on Extra Stock.			
	Total	1724	670	£1219 15 0	408	£808 5 0

Horticulture, Poultry and Industrial Department.

Sections.	Denomination.	No. of Entries.	No. of Prizes Offered.	Amount of Prizes Offered.	No. of Prizes Awarded.	Amount of Prizes Awarded.
				£ s. d.		
1... ..	Horticulture	... ...	142	40 10 0		
2... ...	Poultry	... ...	52	52 17 6		
3... ...	Domestic Manufactures	... ...	28	23 15 0		
4... ...	Woollen and Flax Goods	... ..	28	36 0 0		
5... ...	Book-binding, Printing, Paper, &c...	... ...	12	12 0 0		
6... ...	Manufactures in Metal, &c... ...	... ...	41	42 18 0		
7... ...	Manufactures in Wood, Cabinetware, Carvings, &c., &c.	... ...	61	41 1 3		
8... ...	Fine Arts, &c...	... ...	52	60 15 0		
9... ...	Ladies' Department	... ...	63	30 16 0		
10... ...	Indian Prizes	... ...	29	13 11 0		
11... ...	Miscellaneous...	... ...	25	25 17 6		
		... ...	533	£379 11 3	... ...	£251 5 0
	Special Prizes.					
	Wm. Workman	12	13	£46 0 0	4	£8 10 0

The foregoing statement will show the number of premiums offered, the amount, the number of entries in each section, and the number of prizes actually awarded in each Section, and the amount, affording a very fair estimate of the encouragement offered by the Board, and the degree of interest felt by the public in the Exhibition.

The Agricultural Association of Lower Canada has been regularly organized during the period of holding the Provincial Exhibition in September last, in conformity to Act 16 Vic., chap. 11, and it was resolved, on that occasion, to hold the next Annual Exhibition at the City of Quebec, in September next, and the Board, as Council of the Agricultural Association, are in communication with the President of the Association, James Gibb, Esq., residing in Quebec, and have appointed a Local Committee to assist in carrying out the Exhibition. They have also decided upon a Prize List for the Agricultural Department, and Rules and Regulations for conducting the Exhibition, which they expect will be brought to a successful issue. A member of the Board, E. J. DeBlois, Esq., is associated with James Gibb, Esq., as a Committee of reference to represent the Board at Quebec during the interval to elapse to the Exhibition.

The Board have received the Annual Reports for the past year from all the Agricultutal Societies in Lower Canada, and although many of these Reports are confined to a statement of the distribution of the funds of these Societies, several others are very interesting, affording the most satisfactory evidence of the healthy progress of agricultural improvement, and the vast benefit derived from the liberal grants by the Legislature for the encouragement of this improvement, that is of such vital importance to the Province.

It is a remarkable proof of the satisfactory working of the Acts 16 Vic. chapters 11 and 18, that of 53 Reports, obtained from one extremity of Lower Canada to the other, not one have made any objection to these Acts, with the exception that two or three have proposed an alteration in the 15th section of chap. 18, which relates to the distribution of the Legislative allowance to societies where more than one is organized in a County, and perhaps it might be advisable to authorize the Board to exercise their own discretion in the distribution of the Legislative allowance in Counties where more than one is in operation.

As well from the Reports of Agricultural Societies as from other reliable sources of information and from personal observation, the Board are perfectly convinced that farmers generally have become sensible of the necessity and importance of introducing an improved system of husbandry, and have already commenced to a considerable extent, even in the most remote sections of Lower Canada, the cultivation of grain crops, the sowing of clover and other grass seeds, and a desire is manifested to improve the neat cattle, sheep and pigs, and provide them with better food. There is also a disposition on the part of many Canadian farmers, to adopt a system of rotation, and pay more attention to ploughing well, draining well, and a more judicious application of manure.

The Board, aware of these circumstances, anticipate the most favorable results from the example of those who have happily introduced an improved system of husbandry, which from its advantages will be sure to be sufficient recommendation to others.

The President of the Board having ascertained that the four members of the Board who retired by lot, in conformity to the Act 16 Vic., chap. 11, namely, Alfred Pinsonault, Esq. ; J. C. Taché, Esq , M. P. P. ; J. B. Dumoulin, Esq., M.P.P., and James Thomson, Esq., were re-elected, gave instructions to the Secretary to call a meeting of the Board to assemble at Montreal on the 9th day of May, 1854, and the meeting took place accordingly, when this Report was submitted and approved, with statements of the distribution of the funds placed at the disposal of the Board for the past year, and the Secretary and Treasurer of the Board was instructed to transmit the report and statement of the funds to the Honorable the Minister of Agriculture at Quebec.

By order of the Board,

WM. EVANS,
Secretary and Treasurer, Board of Agriculture, L. C.

Montreal, May 13, 1854.

Dr. Statement A.—The Board of Agriculture for Lower Canada. Cr.

1853.		£ s. d.	1853.		£ s. d.	£ s. d.
April 1	To balance of the Funds of the Lower Canada Agricultural Society transferred to the Board of Agriculture for L. Canada.	445 17 10	September 16	By Check to John Lovell, balance in full for printing the Agricultural Journal, for 4 months, to 1st May. 1853	124 15 0	
				By Check to Translator of Journal, Mr. Bibaud, for 4 months, to 1st May, 1853	16 13 4	
			" 29	By Check to Editor of Journal, W. Evans, for 3 months up to 1st May, 1853	25 0 0	
			October 1	By Check to W. Evans, balance due him as Secretary to the Lower Canada Agricultural Society, to 28th March, 1853 ...	8 6 8	
						174 15 0
				By balance	... ...	271 2 10
	£	445 17 10			£	445 17 10

Dr. Statement B.—The Board of Agriculture for Lower Canada. Cr.

1853.		£ s. d.	1853.		£ s. d.	£ s. d.
	To balance brought forward from Statement A	271 2 10		By paid, Post Office account for 9 months, to 31st December, 1853.	14 10 9	
				By paid, Furniture for Rooms	11 3 9	
				By paid, Books and Stationery	17 17 8	
				By paid, rent of Rooms for 6 months, to 1st November, 1853 ...	12 10 0	
				By paid, Advertising	4 17 6	
				By paid, Editor and Translator of Farmer's Journal for 6 months, to 1st November, 1853, as per Contract with H. Ramsay ...	56 0 0	
				By paid, Secretary's salary for 9 months, to 28th December, 1853.	75 0 0	
				By paid, three Members of the Board travelling expenses ...	56 5 0	
				By paid, Secretary's travelling expenses to Hamilton Exhibition ...	6 5 0	
						254 9 8
				Balance	... ...	16 13 2
	£	271 2 10			£	271 2 10

1853.	Number and Name of Society.	Amount received. £ s. d.
	To Legislative allowance, received by Government Warrants, for County Agricultural Societies,—	
	1 County of Beauharnois	250 0 0
	2 " Bellechasse No. 1 }	217 12 6
	3 " " No. 2 }	
	4 " Berthier	250 0 0
	5 " Bonaventure No. 1 }	176 14 4½
	6 " " No. 2 }	
	7 " Chambly No. 1 }	250 0 0
	8 " " No. 2 }	
	9 " Champlain	250 0 0
	10 " Dorchester No. 1	83 5 0
	11 " " No. 2	75 0 0
	12 " Drummond	250 0 0
	13 " Gaspé No. 1	160 17 6
	14 " " No. 2	75 0 0
	15 " Huntingdon No. 1 }	249 13 0
	16 " " No. 2 }	
	17 " Leinster No. 1 }	197 5 0
	18 " " No. 2 }	
	19 " L'Islet	129 15 0
	20 " Lotbinière	117 7 6
	21 " Megantic No. 1 }	231 0 0
	22 " " No. 2 }	
	23 " " No. 3 }	
	24 " Montreal	250 0 0
	25 " Missisquoi No. 1 }	250 0 0
	26 " " No. 2 }	
	27 " Nicolet No. 1 }	250 0 0
	28 " " No. 2 }	
	29 " Ottawa No. 1 }	250 0 0
	30 " " No. 2 }	
	31 " " No. 3 }	
	32 " Quebec No. 1	125 0 0
	33 " " No. 2 Not in operation.	
	34 " Richelieu No. 1 }	250 0 0
	35 " " No. 2 }	
	36 " Rimouski	70 10 0
	37 " Rouville No. 1 }	250 0 0
	38 " " No. 2 }	
	39 " Saguenay	117 0 0
	40 " St. Maurice	250 0 0
	41 " St. Hyacinthe No. 1 }	242 12 6
	42 " " No. 2 }	
	43 " Shefford No. 1 }	232 4 0
	44 " " No. 2 }	
	45 " Sherbrooke	250 0 0
	46 " Stanstead	250 0 0
	47 " Terrebonne	250 0 0
	Carried over ... £	6250 16 4½

1853.	Number and Name of Societies.	Retained. £ s. d.	Paid to each. £ s. d.
	By paid Agricultural Societies,—		
	1 County of Beauharnois	25 0 0	225 0 0
	2 " Bellechasse No. 1 }	21 15 3	116 10 2
	3 " " No. 2 }	... ...	79 7 1
	4 " Berthier	25 0 0	225 0 0
	5 " Bonaventure No. 1 }	17 3 5½	86 19 3
	6 " " No. 2 }	... ...	72 1 7
	7 " Chambly No. 1 }	25 0 0	83 1 8
	8 " " No. 2 }	... ...	141 18 4
	9 " Champlain	25 0 0	225 0 0
	10 " Dorchester No. 1 }	8 6 6	74 18 6
	11 " " No. 2 }	7 10 0	67 10 0
	12 " Drummond	25 0 0	225 0 0
	13 " Gaspé No. 1 }	16 1 9	144 15 6
	14 " " No. 2 }	7 10 0	67 10 0
	15 " Huntingdon No. 1 }	24 19 4	120 7 0
	16 " " No. 2 }	... ...	104 6 8
	17 " Leinster No. 1 }	19 4 6	154 15 9
	18 " " No. 2 }	... ...	22 14 9
	19 " L'Islet	12 19 6	116 15 6
	20 " Lotbinière	11 14 9	105 12 9
	21 " Megantic No. 1 }	... ...	76 14 3
	22 " " No. 2 }	23 0 6	70 12 6
	23 " " No. 3 }	... ...	60 13 3
	24 " Montreal	25 9 0	225 0 0
	25 " Missisquoi No. 1 }	... ...	131 2 9½
	26 " " No. 2 }	25 0 0	93 17 2½
	27 " Nicolet No. 1	25 0 0	225 0 0
	28 " " No. 2 No money allowed this Society		No. 2.
	29 " Ottawa No. 1 } ..	... ...	116 9 3
	30 " " No. 2 }	25 0 0	80 8 3
	31 " " No. 3 } ...	... ...	28 2 6
	32 " Quebec No. 1 }	12 10 0	112 10 0
	33 " " No. 2 } Not in operation.		
	34 " Richelieu No. 1 }	... ...	155 7 3
	35 " " No. 2 }	25 0 0	69 12 9
	36 " Rimouski	7 1 0	63 9 0
	37 " Rouville No. 1 }	... ...	68 15 0
	38 " " No. 2 }	25 0 0	156 5 0
	39 " Saguenay	11 14 0	105 6 0
	40 " St. Maurice	25 0 0	225 0 0
	41 " St. Hyacinthe No. 1 }	.. ...	172 15 9
	42 " " No. 2 }	24 5 3	45 11 6
	43 " Shefford No. 1 }	... ...	114 17 3
	44 " " No. 2 }	23 4 5	94 2 4
	45 " Sherbrooke	25 0 0	225 0 0
	46 " Stanstead	25 0 0	225 0 0
	47 " Terrebonne	25 0 0	225 0 0
	Carried over ... £	625 1 8	5625 14 8

DR. STATEMENT C.—The Board of Agriculture for Lower Canada.—(*Continued.*) CR.

1853.	Number and Name of Societies.	Amount Received.	1853.	Number and Name of Societies.	Retained.	Paid to each.
		£ s. d.			£ s. d.	£ s. d.
	Brought forward	6250 16 4½		Brought forward	625 1 8	5625 14 8
	48 County of Two Mountains, No. 1 }			48 County of Two Mountains No. 1 }	... ...	123 10 6
	49 " " No. 2 }	246 16 6		49 " " No. 2 }	24 13 8	98 12 4
	50 " Vaudreuil No. 1 }			50 " Vaudreuil No. 1 }	.. ..	111 7 8
	51 " " No. 2 }	163 10 0		51 " " No. 2 }	16 7 0	35 15 4
	52 " Verchères No. 1 }			52 " Verchères No. 1 }	... ..	122 9 4
	53 " " No. 2 }	250 0 0		53 " " No. 2 }	25 0 0	102 10 8
	54 " Yamaska	165 13 6		54 " Yamaska	16 11 4	149 2 2
	£	7076 16 4		£	707 13 8	6369 2 8

DR. STATEMENT D.—The Board of Agriculture for Lower Canada. CR.

1853.		£ s. d.	1853.		£ s. d.	£ s. d.
	To Government Grant to Board of Agriculture by Warrant this date	1000 0 0		By four Cheques to Treasurer Local Committee for exhibition amounting to	. . .	800 0 0
	To Amount 10 per cent. on Moneys received for Agricultural Societies. (See Statement C)	707 13 8		By paid Cheques to H. Ramsay, for advertising, &c., for Exhibition	. . .	210 16 5
	To Balance	42 17 9		By Amount Prizes awarded in Agricultural Department of Exhibition	763 15 0	
				Prizes awarded in the following Classes, not yet claimed:— £ s. d.		
				Class 10—Wm. Parker 0 10 0		
				28—R. Macdonnel 0 10 0		
				29—B. Groux 2 0 0		
				40—E. C. Doucrean 1 0 0		
				73—Martin Hébert 1 10 0		
				85—C. Hoyle 5 0 0		
				94—3 Prizes for Sugar 2 10 0		
				100—3 Prizes for Oats 3 0 0		
				102—Seminary, Montreal 0 10 0		
				115—Richd. Freeman 0 5 0		
				119—James Lelly 0 5 0		
				124—Joseph Fortin 1 0 0		
				147—Page & Co 1 19 0		
				150—Wright & Co., Oshawa 1 0 0		
				70 and 71—Ed. Braithwaith 3 10 0		
				Unclaimed to be paid £24 0 0	24 0 0	739 15 0
				Baron Longueuil left a prize to be offered for the best Hereford Bull at the next Exhibition, £4.		
	£	1750 11 5		£		1750 11 5

Montreal, May 9, 1854.

WM. EVANS, Sec'y and Treasurer
Board of Agriculture.

DR. STATEMENT of the Funds of the Board of Agriculture for Lower Canada, commencing from March 28, 1853. CR.

1853.		£ s. d.	1853.		£ s. d.	£ s. d.
March 28.	To Balance of Funds of the Lower Canada Agricultural Society, transferred to the Board of Agriculture	445 17 10	May 4.	By paid for printing Agricultural Journal for 4 months to 1st May, 1853	124 15 0	
Sept. 19.	To Warrant from the Government in aid of the Provincial Exhibition at Montreal	1000 0 0		By do Editor and Translator for same period	50 0 0	
1854.			1854.			174 15 0
Sept. to Feb.	To seven Warrants from the Government for payment of Agricultural Societies organized in Lower Canada	7076 16 4	Sept. to Feb.	By amount paid to Agricultural Societies organized in Lower Canada for the year 1853		6369 2 8
	Balance	26 4 7	1853. October.	By paid expenses of Provincial Exhibition at Montreal, September, 1853 :—		
				" Treasurer Local Committee	800 0 0	
				" H. Ramsay, for printing and cards	210 16 5	
				" Premiums in Agricultural Department	739 15 0	
						1750 11
				Unclaimed Prizes yet to pay £24		
				By paid towards expenses of Farmers' Journal as per contract with H. Ramsay, for 6 months, to 1st November, 1853	56 0 0	
				" Secretary's Salary for 9 months, to 28th December, 1853	75 0 0	
				" Do travelling expenses to Hamilton	6 5 0	
				" Travelling expenses to 3 Members of the Board of Agriculture	56 5 0	
				" Rent of Rooms for 6 months	12 10 0	
				" Post Office to 31st December, 1853	14 10 9	
				" Furnitures for Rooms	11 3 4	
				" Books, Stationery, &c..	17 17 8	
				" Advertising	4 17 6	
						254 9 8
	£	8548 18 9			£	8548 18 9

By order,

WM. EVANS,
Secretary and Treasurer
Board of Agriculture.

Montreal, May 9th, 1854.

SUPPLEMENTARY REPORT

OF

MR. HOLWELL,

TO

THE HONBLE JOHN ROLPH,

MINISTER OF AGRICULTURE.

(No. 22.)

QUEBEC, 20th January, 1854.

SIR,—Having, in conformity with your instructions of the 20th ultimo, completed, as far as my own personal attendance was concerned, the business of the commission to which I was appointed by His Excellency the Governor General, on the 2nd May 1853, I have the honor to submit the following statement of my proceedings generally since the date of my last Report (No. 21) of the 13th December, 1853; begging, at the same time, to refer you to my Reports (No. 12) of the 25th October, and (No. 13,) of the 1st of November last.

2nd. By far the greater number of the Canadian exhibitors have, in reply to the Circular addressed to all of them by me on the 1st November last, (copy of which Circular was enclosed in my Report No. 13,) requested that their contributions should be returned to them; as however it was at that time too late in the season to admit of their being so returned before the close of the navigation, and as they could not, with the exception of a few light articles, be sent back overland without incurring a very heavy expense for freight, besides additional risk of damage, it has been considered advisable to defer doing so until as early as may be practicable in the ensuing spring.

3rd. In the meantime, it became necessary either to cause such goods to be repacked and stored in some *bonded* warehouse at New York, until the re-opening of the navigation, or to make arrangements for leaving them on Exhibition for the present; the latter course was deemed the most advisable for several reasons with which I need not now trouble you.

4th. Some of the Exhibitors have signified their desire to leave their contributions on Exhibition, agreeably to the provisions of the Circular issued by the association on the 31st October, (copy of which Circular I had the honor of forwarding to you on the 1st November, 1853) whilst a few others have directed that theirs should be handed over to their agents in New York, for sale, or to be otherwise disposed of.

5th. The duty of giving effect to these several instructions, and of making all the preliminary arrangements with the association, entries at the Custom House, &c., has been assigned to Mr. C. H. Castle, of New York, as already reported to you on the 13th ultimo.

6th. The services of Mr. S. Marshall (who has charge of a portion of the goods in the English and Irish Departments) have been engaged for the *immediate* care and custody of the Canadian contributions until they shall have been fully disposed of, as above stated, instead of Mr. Jourdain, my agreemeent with whom (as reported to you on the 13th ultimo,) was objected to by the association as being incompatible with his other duties. Mr. Marshall is to receive the same very moderate remuneration as that agreed on with Mr. Jourdain, viz: $10 per month, commencing from the 24th December, the date on which the services of Mr. West, as care-taker, at $40 per month, were dispensed with.

7th. As the association, in their Circular of the 31st October, had intimated that, unless they were apprized in writing, on or before the 1st January, 1854, of the desire of Exhibitors to retain the space occupied by them, it would be reallotted to other parties, I considered it desirable for the interests of those persons who had already contributed to the representation of Canada, as well as of those who might hereafter be disposed to do so, to apply generally in behalf of Canada for the reservation of the space occupied by the Canadian Department; copies of my application, dated 14th December, and of the reply thereto from the association, acceding to my request, are herewith submitted—(Nos. 1 and 2.)

8th. As to the advantages likely to accrue to the agriculturists, the manufacturers, the *inventors* and others of Canada, from the display of their respective productions at the New York Exhibition, those parties are, or ought to be the best judges; my own conviction, founded upon the experience afforded me by my intimate relations with the exhibition, and more especially with the Canadian Department, is that those advantages are real and substantial, even though they may not be in all cases (as they occasionally have been) immediately obvious or perceptible; yet, however this may be, I considered it my duty to secure for Canadians the option of availing themselves of the privilege or not, by retaining for their benefit that space which I *knew* hundreds of American and other Exhibitors were anxious to obtain *at high prices.*

9th. In notifying to the inhabitants of Canada that such space is at their disposal (a notification which, I respectfully suggest, should be made public at as early a date as may be convenient, and in such manner as the Provincial Government may deem most effectual), it will of course be necessary to explain to intending Exhibitors that the duty, the responsibility, and the expense of forwarding their contributions, of displaying them at the Crystal Palace, and of their proper care and preservation while there, will devolve upon themselves.

10th. The awards of the Jurors appointed to examine and report upon the various articles exhibited in the several classes, were nearly all rendered to the Commissioners of Juries previous to my leaving New York, and I had been given to understand that the whole of them would be published in a few days, and that copies of such awards would be forwarded to me; but, although I have delayed the closing of this report much longer than I had intended, in the hope of being able to communicate that which I felt would prove of so much interest, I regret to say that I have not yet received the promised communication: in the absence however of official information on the subject, I may without indiscretion state that I feel confident that Canada will have no reason to complain of the awards when made public, and further that I shall be much mistaken if she does not carry off fully as many prizes and "honorable mentions," in proportion to the number of her contributions, as any other country represented at the Exhibition.

11th. Should it meet with your approbation I would suggest that a copy of the awards of the Jurors (in so far at least as they relate to Canadian contributions) a copy of the revised catalogue and a letter of thanks, be addressed to each of the parties who may have contributed to the representation of Canada at the New York Exhibition.

12th. During my sojourn at New York, I took advantage of the very few intervals of time that I could spare from the most pressing and immediate duties of my mission, to examine and enquire somewhat minutely into the construction, operation, results, prices, &c., of a few of such among the numerous agricultural and other implements and labor-saving machines exhibited at the Crystal Palace, as appeared to be more especially suited to the wants and purposes of Canada: the rough notes of my observations, and a few drawings, which I brought with me would probably enable me to draw up such brief reports upon the respective mer-

its of the artists so examined as might, (although by no means elaborate or scientific descriptions,)enable parties interested to form some idea of the adaptation of the several implements or machines to their own requirements:—should you deem such reports worthy of acceptance, whether for publication or otherwise, I shall be happy to prepare and forward them to you as early as possible.

13th. Although I consider that my duties as Commissioner and my relations with the Provincial Government, at least as their salaried officer, terminated on the 1st instant, when I resumed my charge in the Ordnance Department, I shall at all times be most happy if I can be of any, the slightest service, or afford any information, not only as regards the Canadian representation at the New York Exhibition, but as affecting those industrial interests of Canada, the advancement and prosperity of which will ever be with me objects of peculiar interest and of the warmest solicitude.

14th. Before closing this my final report, I may, I trust, be permitted to take a retrospective view of and to offer a few observations upon the practical operation of the plan adopted by the Provincial Government (in the most liberal and friendly spirit,) in furtherance of a representation of Canada at the New York Exhibition; upon the general apathy and want of co-operation that the people of Canada, (with a few honorable exceptions) have shewn in a matter in which some of their best interests appear, to me at least, to have been concerned, and upon the consequent failure of that full measure of success which Canada could undoubtedly have reaped, had a different plan of operations been adopted, and if a greater amount of energy, enterprise and friendly feeling had been displayed by the industrial classes of Canada.

15th. The Executive, according to the Secretary's letter of the 5th March, 1853, agreed to " appoint one or more persons on behalf of the Government, at each of " the cities of Quebec, Montreal, Kingston, and Toronto, to act in conjunction " with such persons as might be nominated by those localities, as a Committee to " select and take charge of such articles as might be considered by them, with " the approval of the Government, worthy of transmission to New York," and further to " provide for the conveyance of such articles to the last mentioned city " and back, free of all charges to the parties concerned;" this decision was, immediately on its receipt by the Quebec Local Committee, extensively circulated throughout the Quebec district, and also communicated to the local Committee and to other parties supposed to take an interest in the movement, in each of the cities therein named.

16th. In the meantime it had been decided by the Executive to appoint only one person to act as Commissioner for the whole Province ; and, as there were not in reality any persons nominated by the respective localities, with the exception perhaps of Quebec and Toronto, (in neither of which however the intention was fully carried out,) as a Committee to select and take charge of the articles contributed by such localities, the sole charge of all the goods from Canada subsequently devolved upon the Commissioner, contrary, no doubt, to the original intention of the Executive.

17th. During the month of May last, having been honored by His Excellency the Governor General with the appointment of Commissioner, I proceeded by order of the then Minister of Agriculture to all the chief cities in the Province, as far as London, Canada West, for the purpose of making the necessary arrangements, in concert with the several Committees which I might find already organized, or that might subsequently be formed for the purpose of giving effect to the proposed measure.

18th. My several reports (Nos. 1 to 5) to the Honourable Mr. Cameron, will have sufficiently explained the apathy, the obstacles and even the opposition I had to encounter, " the time was too short;" " there was nothing ready ;"

" the manufacturers were all too busy ;" " contributors to the London Exhibition had been badly treated by the Government ;" " the New York Exhibition was a speculation and a humbug ;" " the object itself was without interest to Canada, especially after her great success at the London Exhibition ;" (an argument, the soundness of which I never could appreciate) " Commissioners ought to have been named in each of the cities mentioned in the Secretary's letter ;" " no direct communication from the Government had been received by the several local Committees ;" one city " had been slighted intentionally by not being named in the Secretary's letter ;" in fact the measure seemed to find but little favor in any portion of the two Canadas.

19th. I must however, at the same time, acknowledge (and I do so with much gratification,) that, in spite of all these discouraging influences, I met with a great deal of courteous consideration and of cordial assistance, even in what was considered a hopeless undertaking, from several influential and public spirited individuals at Montreal, Kingston, Toronto, Hamilton and London; the consequence being that in each of those cities, with the exception of Hamilton, Committees were either formed or re-organized ostensibly for the purpose of collecting and forwarding contributions. (Quebec had already taken the lead, and has nobly established her claim to by far the largest share of the honor and credit of the Canadian representation, and will doubtless reap her reward in the largest share of the Canada prize list.)

20th. The provisions of the Secretary's letter, and the arrangements proposed in consequence, and nominally agreed to by the several Local Committees, were however, but very partially carried out, and in many cases not at all, nevertheless, after several vexatious, but perhaps unavoidable delays, a very fair collection of contributions was received, principally from Quebec, Montreal, and Toronto ; but the space originally intended for Canada had, in the mean time, been appropriated to American and other exhibitors ; and much time was again lost in obtaining a new site for the Canadian Department, and in getting it properly fitted up and the contributions suitably arranged and displayed therein.

21st. And here I regret to have to state that certain parties from Canada, who about this time visited the Exhibition, observing the confusion and want of arrangement necessarily attendant upon all these adverse circumstances, instead of taking the trouble to enquire into the cause of them, or to afford any advice or assistance, (both of which would have been thankfully received and duly appreciated,) in remedying the evil, preferred to avail themselves of the opportunity to rail in the bitterest and most hostile manner, and in some cases to circulate the most exaggerated and unfounded reports against the Commissioner, the Canadian Department, and the whole Exhibition : and this at the very time when the President and principal officers of the association, the foreign Commissioners, especially those of Great Britain, the New York press, and the American people generally were daily noticing in the most flattering and complimentary terms, the unexpected extent, variety and interest of the Canadian representation : as to the arrangements made by me for giving effect to the intentions of the Government, which, strictly speaking, was the legitimate limit of my duty, although I did not by any means confine myself thereto, I can only say, 1st. That I am conscious of having spared neither time, nor trouble, nor zealous attention, in doing all that I could devise for the benefit of the representation, even to the injury at one time of my own health, and that I cheerfully leave the decision as to how far I may have succeded, in the hands of my employers (and especially of the Honorable Malcolm Cameron, who had an opportunity of personally judging of the manner in which I performed my duties,) as well as of the reasonable and intelligent portion of the seven or eight thousand Canadians who visited the Exhibition. I may here, I trust, be excused for submitting to your notice two communications on the subject

of the Canadian Department, at the New York Exhibition; the one addressed to the Editor of the Montreal Gazette, the other a contribution to the Quebec Chronicle.

22nd. Although Mr. Secretary Morin's letter of the 5th March, 1853, as before quoted, most explicitly limited the action of the Government to the "conveyance of the contributions to New York and back free of all charges to the parties interested," and although in the arrangements entered into by me with the several local Committees it was especially recommended and understood that some person should be sent to New York, with the contributions from each locality, for the purpose of assisting in the arrangement, display and decoration, if thought advisable, of their respective contributions; yet the whole burden of such duties, as well as the provision of glass cases and other suitable receptacles for the several contributions, was most mercilessly thrown upon the Commissioner, who was looked upon rather as the agent or servant of each individual contributor than as the representative of the Provincial Government and of the Canadian Exhibitors collectively, without reference to any particular person or place: numerous and occasionally amusing evidences of the existence of this impression might be selected for your perusal, from among the voluminous correspondence now in my possession relative to the Canadian representation; but I fear I have already trespassed much longer than I ought, upon your time and attention: I would, however, beg to mention that among all the other Commissioners, Foreign as well as American, with whom I became acquainted, not one was in any way connected with or interested for any individual contributor; each exhibitor having his own paid agent, (one person frequently acting for a number of exhibitors) or having consigned and entrusted his contributions to the care and custody of the association; the Commissioner was thus enabled to represent in a much more effective manner the general interests of the country he came from, as well as those of all the exhibitors collectively and individually, and to examine and report upon all such objects and matters of interest to that country, as the exhibition and all its attendant incidents might furnish him with. Whatever, therefore, may be the extent of pecuniary aid which the Provincial Government, in a spirit of enlightened liberality, may be induced at any time to afford towards a proper representation of the industrial resources and interests of Canada, at any similar international Exhibition, I would very respectfully, yet most earnestly recommend that it should abstain entirely from the assumption of any charge or care of contributions, and from all management or control of the business details of such representation; matters which I feel convinced can only be managed to the satisfaction of contributors by agents selected and paid by themselves. This observation would not of course apply in case the Executive should, at any time, with the object of promoting a representation of the Agricultural and other Industrial resources of the country, procure by purchase such samples of its produce or manufactures as may appear desirable for that purpose; a plan which will probably, for some years, be the only one likely to meet with the fullest success in Canada.

Apologizing for the extreme length of this communication,

I have the honor to be,
Sir,
Your most obedient and humble servant,

W. ANTROBUS HOLWELL,
Commissioner for Canada,
New York Industrial Exhibition.

The Honorable John Rolph,
Minister of Agriculture.
&c., &c., &c.

QUEBEC, 20th September, 1854.

SIR,—I have the honor to report the receipt from New York of fourteen Bronze Medals and of forty-six Diplomas, for distribution among the Canadian Contributors to the New York Industrial Exhibition, according to the enclosed list (No. 1) received therewith through Mr. C. H. Castle, the resident Agent of the Canada Commission at New York.

I at the same time beg to enclose a correct classified list (No. 2) of the several Canadian Exhibitors to whom awards were made, together with an alphabetical list (No. 3) of the same, for more convenient reference: a comparison of these lists with the one forwarded by Mr. Castle will show the following differences, viz:—

	Awarded.	Received.	Remaining due.
Bronze Medals "*with special approbation*"	2	1	1
Bronze Medals with diploma	20	13	7
Diplomas of "Honorable mention."	44	32	12
Totals	66	46	20

Thus leaving one Bronze Medal "*with special approbation*," seven Bronze Medals with diplomas, and twelve diplomas of "Honorable mention," yet to be received.

I have written, this day, to Mr. Castle, enclosing a statement of such deficiencies, together with the particulars of each award thus omitted, and requesting him to use all possible despatch in forwarding them:—in the mean time I beg to apply for your instructions, as to the manner in which you may wish the Medals and Diplomas already received to be distributed to the respective parties entitled to them.

I would at the same time respectfully suggest that the enclosed List No. 2 be published for the information of parties concerned.

I have the honor to be,
Sir,
Your most obedient humble servant,

W. ANTROBUS HOLWELL,
Commissioner for Canada, N. Y. Industrial Exhibition.

The Honorable
Sir Allan N. McNab, M. P. P.,
Minister of Agriculture,
&c. &c. &c.

No. 1.

List of the respective parties for whom Diplomas, accompanied by Bronze Medals, as well as of Diplomas containing "Honorable Mention," have been this day forwarded to Wm. Antrobus Holwell, Esq., Quebec, Canadian Commissioner for the New York Industrial Exhibition, 1853, by C. H. Castle :—

Revd. J. G. Geddes,	Hamilton,	Bronze Medal.
Madame J. B. Bouchard,	St. Vallière,	do
Miss Globensky,	Lachine,	do
J. Têtu,	Berthier,	do
Mlle. P. Martel,	St. Ambroise,	do
Van Brocklyn, Winter & Co.	Brantford,	do
Mrs. John Reid,	Belleville,	do
C. Reinhart,	Montreal,	do
Miss Eliza Dutton,	do	do
Miss Kate Thompson	Toronto,	do
James McGrath,	do	do
Mrs. Thompson,	Quebec,	do
Madame J. B. Jobin,	do	do
Wm. Antrobus Holwell,	do	Bronze Medal and Diploma "with special approbation."
Hypolite Blouin,	Berthier,	Honorable Mention.
Betsy Rousseau,	St. Hilaire	do
John Robertson,	Long-Point,	do
Smith Bartlet,	Bellville,	do
J. W. Bailey,	Megantic,	do
Madame Lamère,	St. Laurent,	do
Jones & Co.,	Gananoque,	do
Louis Boivin,	Cacouna,	do
Asa M. Westover,	Durham,	do
P. C. Sinclair,	Cobourg,	do
John Robb,	Montreal,	do
Edward Trenholm,	Kingsey,	do
A. Griffin,	Waterdown,	do
J. B. Ewart,	Dundas,	do
Samuel Hulbert,	Prescott,	do
John Esinhart,	Laprairie,	do
François Couture,	St. Ambroise,	do
Madame Couture,	do	do
Angus McNaughton,	Hinchinbrook,	do
J. Muir,	do	do
J. Muir,	do	do
Francis Silverthrone,	Toronto,	do
James Fleming,	do	do
E. W. Thompson,	do	do
M. Paquet,	Quebec,	do
Jno. R. Lambly,	do	do
James Morgan	do	do
Col. Irvine,	do	do
M. Pacquet,	do	do
Madame Aubé,	Canada,	do
Madame Genest, and	do	do
Robt. G. McMullen,	do	do

RECAPITULATION.

	Awarded.	Received.	Remaining due.
Bronze Medals, with special approbation	2	1	1
Bronze Medals with Diplomas	20	13	7
Honorable Mention	44	32	12
Totals	66	46	20

No. 2.

NEW YORK INDUSTRIAL EXHIBITION,

List of Awards of the Juries to Contributors from Canada.

Class 3—Substances used as Food, &c.

Bronze Medal.

To the Agricultural Society of Toronto, C. W., for a "*very fine*" sample of White Wheat (66 ½ lbs. to the bushel,) grown by John B. Carpenter, of Townsend, C. W.

" C. Reinhart, Montreal C. E., for "Superior" Hams.

Honorable Mention.

To J. W. Bailey, Leeds, Megantic, C. E., for Maple Sugar.
" Smith Bartlett, Belleville C. W., for Peas.
" Hypolite Blouin, Berthier en bas, C E., for Timothy Seed.
" Louis Boivin, Cacouna, C. E., for Wheat.
" François Couture, St. Ambroise, C. E., for Skinless Barley, and Canadian Oats.
" L. A. Cummer & Co., Waterdown Mills, C. W., for Flour (superior double cooled.)
" J. B. Ewart, Dundas, C. W., for Flour.
" James Fleming, Toronto, C. W., for White Marrowfat Peas.
" A. Griffin, Ransom Mills, Waterdown, C. W., for Extra Superfine Flour.
" Madame Lamère, St. Laurent, C. E., for Colored Beans.
" R. Lambley, Quebec, C. E., for Maple Sugar and Syrup.
" R. McMullen, Toronto, C. W., "Superior" Irish Lundy Foot Snuff.
" Angus McNaughton, Hinchinbrooke, C. E. for "very superior" Honey.
" J. Muir, Hinchinbrooke, C. E., for Wheat, Peas and Oats.
" " " for very good Cheese.
" M. Pacquet, Quebec District, C. E., for Beans.
" John Robb, Montreal, C. E., for Wine Crackers.
" Betsy Rousseau, St. Hilaire, C. E., for Maple Sugar, granulated and in cakes.
" Francis Silverthorne, Toronto, C. W., for Pot and Pearl Barley.
" P. C. Sinclair, Cobourg, C. W., for "*superior*" Cobourg Sauce.
" E. W. Thompson, Toronto, C. W., for Barley.
" Edward Trenholm, Kingsey, C. E., for Buckwheat Flour.
" Asa Westover, Dunham, C. W., for Maple Sugar and Syrup.

Class 4—*Vegetable and Animal Substances employed in Manufactures.*

HONORABLE MENTION.

To Arch. McFarlane, Montreal, C. E., for Glue from Common Stock, or Tanners pieces or "screws."
" The Hon. G. Joley, Lotbinière, C. E., for Vegetable fibre, &c.
" M. Pacquet, Quebec District, C. E., for dressed Flax.

Class 5—*Machines for direct use, Carriages, &c.*

BRONZE MEDAL.

To J. J. Saurin, Quebec, C. E., for two Sleighs.

Class 9—*Agricultural, Horticultural, Dairy, and other Implements.*

BRONZE MEDAL WITH SPECIAL APPROBATION.

To W. Antrobus Holwell, Quebec, C. E., for an ingeniously constructed Fruit-gatherer.

BRONZE MEDAL, WITH DIPLOMA.

" Van Brocklin, Winter & Co., Brantford, C. W., for a Threshing and Separating Machine.

HONORABLE MENTION.

To Samuel Hulbert, Prescott, C. W., for a Patent Plough.
" Ford, Jones & Co., Gananoque, C W., for a case of Shovels and Spades.
" John Robertson, Long Point, C. E., for a Seed Sower.

Class 10—*Philosophical Instruments and Products resulting from their use.*

HONORABLE MENTION.

To John Esinhart, Laprairie, C. E., for a Manuscript Map of the United State &c., (executed by him when 14 years of age.)

Class 12—*Manufactures of Wool.*

BRONZE MEDAL, WITH SPECIAL APPROBATION.

To J. Patterson, Elgin Mills, Dundas, C. W., for Twilled Blankets, "the best exhibited."

Class 14—*Manufactures of Flax and Hemp.*

HONORABLE MENTION.

To Madame Bouchard, St. Valière, C. E., for "*excellent home-made Linen.*"

Class 16—*Leather, Furs, and their Manufactures.*

BRONZE MEDAL.

To the Indians of Lorette for "excellent" specimens of dressed and undressed Deer and Moose Skins.
" C. H. Têtu, Rivière Ouelle, C. E., for "excellent" specimens of Porpoise Leather.

HONORABLE MENTION.

To W. Antrobus Holwell, Quebec, C. E., for the "Duplex Safety Rein."

Class 19—*Tapestry, Carpets, Embroidery, Fancy Needlework, &c.*

BRONZE MEDAL.

To Madame Bouchard, St. Valière, C. E., for a Knitted Counterpane and Curtains.
" Miss Eliza Dutton, Montreal, C. E., for a Knitted Cradle Quilt.
" The Revd. J. G. Geddes, Hamilton, C. W., for a Berlin Wool Carpet, (embroidered by the Ladies of Hamilton.)
" Miss Globensky, Lachine, C. E., for a complete set of Embroidered Furniture.
" Miss P. Martel, St. Ambroise, C. E., for Lace Caps and Collars.
" James McGrath, Toronto, C. W., for a Berlin Wool Carpet, (embroidered by the Ladies of Toronto.)
" Mrs. John Reid, Belleville, C. W., for a Knitted Quilt.
" Mrs. Thompson, Quebec, C. E., for a Baby's Knitted Dress.
" Miss Kate Thomson, Toronto, C. W., for a Rose-point Lace Collar.

Class 20—*Wearing Apparel.*

BRONZE MEDAL.

To Madame J. B. Jobin, Quebec, C. E., for Knitted Woollen Over Socks.
" J. Têtu, Berthier, C. E., for Woollen Night Caps.
" Jos. Barbeau, Quebec, C. E., for Cavalier Boots.

HONORABLE MENTION.

To Madame Aubé, C. E., for Woollen Stockings.
" Madame Couture, St. Anselme, C. E., for Knitted and Woollen Stockings.
" Madame Laurent, C. E., for Woollen Hosiery.

Class 22—*Iron, Brass, Pewter and General Hardware.*

HONORABLE MENTION.

To J. K. Griffin, Burford, C. W., for an "*ingeniously devised*" Cooking Stove.
" Hiram Piper, Toronto, C. W., for an improved Hip Bath, &c.

Class 25—*Porcelain and other Ceramic Manufacture.*

BRONZE MEDAL.

To Messrs. Bell, Quebec, C. E., for specimens of Pottery.

HONORABLE MENTION.

To Mr. Maclaren, Yamaska Pottery, C. E., for Roofing Tiles, Bricks, &c.

Class 26—*Decorative Furniture, &c.*

HONORABLE MENTION

To Lieut. Col. Irvine, A. D. C., Quebec, C. E., for Maple Table Top, decorated with the natural leaves of Maple.

Class 27—Manufactures in Marble, Slate and other Ornamental Stone, &c.

HONORABLE MENTION.

To Felix Morgan, Quebec, C. E., for design and cutting of Gothic Font (in Pictou Stone.)

Class 28—Manufactures from Animal and Vegetable Substances not otherwise specified.

HONORABLE MENTION.

To Thomas Moore, Thornhill, C. W., for Axe-handles.

Class 29—Miscellaneous Manufactures.

HONORABLE MENTION.

To Miss Cochrane, Quebec, C. E., for Wax Fruit.

" Industrial Exhibition Committee of Quebec, for a Money Purse, Table Mats, Knife Sheath, Mink and Musk Rat Skin Bags, Moose Deer and Cariboo Feet, Bark Work, Card Trays, Baskets, Cigar Cases, Fan, Watch Holders and Card Cases, all prepared, manufactured and ornamented, by the Lorette Indians.

" Miss Caroline Schiller, Montreal, C. E., for a large Bark Box, elaborately worked with Moose Hair.

Class 30—Musical Instruments.

BRONZE MEDAL.

To J. B. Zeigler, H. M. 66th Regt., Quebec, C. E., for "*ingenious*" improved Cornopean.

RECAPITULATION.

Bronze Medals with Special Approbation	Class No.	9	12												2
		1	1												
Bronze Medals	Class No.	3	5	9	16	19	20	25	3						20
		2	1	1	2	9	3	1	1						
Honorable Mention	Class No.	3	4	5	10	14	16	20	22	25	26	27	28	29	44
		23	3	3	1	1	1	3	2	1	1	1	1	3	
															66

W. ANTROBUS HOLWELL,
Commissioner for Canada, New York Industrial Exhibition.

Alphabetical List of Exhibitors from Canada, at the New York Industrial Exhibition, 1853, to whom awards were made by the Juries.

Name.	Residence.	Class.	No. in Catalogue.	Contribution.	Award.
Agricultural Society	County Toronto, C. W.	3	18	Wheat	Bronze Medal.
Aubé, Madame	C. E.	20	4	Woollen Stockings	Honorable Mention.
Bailey, J. W.	Leeds, Megantic, C. E.	3	8	Maple Sugar	Honorable Mention.
Barbeau, Jos.	Quebec, C. E.	20	6	Cavalier Boots, &c.	Bronze Medal.
Bartlett, Smith	Belleville, C. W.	3	17	Peas	Honorable Mention.
Bell, Messrs.	Quebec, C. E.	25	1	Pottery, &c.	Bronze Medal.
Blouin, Hypolite	Berthier (en bas), C. E.	3	1	Timothy Seed	Honorable Mention.
Boivin, Louis	Cacouna, C. E.	3	2	Wheat	Honorable Mention.
Bouchard, Madame	St. Valière, C. E.	14	1	Home made Linen	Honorable Mention.
Do. do.	Do.	19	3	Knitted Counterpane and Curtains	Bronze Medal.
Cochrane, Miss	Quebec, C. E.	29	3	Wax Fruit	Honorable Mention.
Committee, Local Exhibition	Do.	29	4	Various Indian Manufactures	Honorable Mention.
Couture, François	St. Ambroise, C. E.	3	4	Barley and Oats	Honorable Mention.
Couture, Madame	Do.	20	10	Knitted Woollen Stockings	Honorable Mention.
Cummer, L. A. & Co.	Waterdown Mills, C. W.	3	26	Flour	Honorable Mention.
Dutton, Miss Eliza	Montreal, C. E.	19	7	Knitted Cradle Quilt	Bronze Medal.
Esinhart, John	Laprairie, C. E.	10	1	Manuscript Map	Honorable Mention.
Ewart, J. B.	Dundas, C. W.	3	24	Flour	Honorable Mention.
Fleming, James	Toronto, C. W.	3	22	Peas	Honorable Mention.
Geddes, the Rev. J. G.	Hamilton, C. W.	19	10	Berlin Wool Carpet	Bronze Medal.
Genest, Madame Laurent	C. E.	20	1	Woollen Hosiery	Honorable Mention.
Globensky, Miss	Lachine, C. E.	19	8	Embroidered Furniture	Bronze Medal.
Griffin, A.	Waterdown, C. W.	3	33	Flour	Honorable Mention.
Griffin, J. K.	Burford, C. W.	22	6	Cooking Stove	Honorable Mention.
Holwell, W. Antrobus	Quebec, C. E.	9	1	Fruit Gatherer	Bronze Medal, special approbation.
Do. do.	Do.	16	2	Duplex safety Rein	Honorable Mention.
Hulbert, Samuel	Prescott, C. W.	9	3	Patent Plough	Honorable Mention.
Indians, The at	Lorette, C. E.	16	3	Deer and Moose Skins	Bronze Medal.
Irvine, Lieut. Col.	Quebec, C. E.	26	1	Maple Table Top	Honorable Mention.
Jobin, Madame	Do.	20	2	Knitted Woollen over Socks	Bronze Medal.
Jobin, G.	Lotbinière, C. E.	4	2	Vegetable Fibre	Honorable Mention.
Jones, Ford & Co.	Gananoque, C. W.	9	4	Spades and Shovels	Honorable Mention.
Lamêre, Madame	St. Laurent, C. E.	3	9	Colored Peans	Honorable Mention.
Lambly, R.	Quebec, C. E.	3	6	Maple Sugar, &c.	Honorable Mention.
McFarlane, Arch.	Montreal, C. E.	4	6	Glue	Honorable Mention.
McGrath, James	Toronto, C. W.	19	9	Berlin Wool Carpet	Bronze Medal.
McLaren, J.	Yamaska, C. E.	25	1	Roofing Tiles and Bricks	Honorable Mention.
McMullen, R.	Toronto, C. W.	3	19	Snuff	Honorable Mention.
McNaughton, Angus	Hinchinbrooke, C. E.	3	11	Honey	Honorable Mention.
Martel, Miss P.	St. Ambroise, C. E.	19	4	Lace Caps and Collars	Bronze Medal.
Moore, Thomas	Thornhill, C. W.	28	4	Axe handles	Honorable Mention.
Morgan, Felix	Quebec, C. E.	27	1	Baptismal Font	Honorable Mention.
Muir, J.	Hinchinbroke, C. E.	3	10	Wheat, Peas and Oats	Honorable Mention.
Do.	Do.	3	10	Cheese	Honorable Mention.
Pacquet, M.	Quebec District, C. E.	3	3	Beans	Honorable Mention.
Do.	Do.	4	1	Dressed Flax	Honorable Mention.
Patterson, J. (Elgin Mills)	Dundas, C. W.	12	12	Twilled Blankets	Bronze Medal, special approbation.
Piper, Hiram	Toronto, C. W.	22	3	Improved Hip Bath, &c.	Honorable Mention.
Reid, Mrs. John	Belleville, C. W.	19	11	Knitted Quilt	Bronze Medal.
Reinhart, C.	Montreal, C. E.	3	14	Hams	Bronze Medal.
Robb, John	Do.	3	12	Wine Crackers	Honorable Mention.
Robertson, John	Long Point, C. E.	9	2	Seed Sower	Honorable Mention.
Rousseau, Betsey	St. Hilaire, C. E.	3	16	Maple Sugar	Honorable Mention.
Saurin, J. J.	Quebec, C. E.	5	2	Two Sleighs	Bronze Medal.
Schiller, Miss Caroline	Montreal, C. E.	29	6	Embroidered Park Box	Honorable Mention.
Silverthorne, Francis	Toronto, C. W.	3	25	Pot and Pearl Barley	Honorable Mention.
Sinclair, P. C.	Cobourg, C. W.	3	20	Cobourg Sauce	Honorable Mention.
Tétu, C. H.	Rivière Ouelle, C. E.	16	1	Porpoise Leather	Bronze Medal.
Tétu, J.	Berthier, C. E.	20	21	Woollen Night Caps	Bronze Medal.
Thompson, E. W.	Toronto, C. W.	3	5	Parley	Honorable Mention.
Thompson, Mrs.	Quebec, C. E.	19	12	Baby's knitted Dress	Bronze Medal.
Thomson, Miss Kate	Toronto, C. W.	19	6	Rose Point Lace Collar	Bronze Medal.
Trenholme, Edward	Kingsey, C. E.	3	13	Buckwheat Flour	Honorable Mention.
Van Brocklin, Winter & Co.	Brantford, C. W.	9	5	Threshing Machine	Bronze Medal,
Westover, Asa	Dunham, C. E.	3	15	Maple Sugar	Honorable Mention.
Zeigler, J. B., 66th Regt.	Quebec, C. E.	30	1	Improved Cornopean	Bronze Medal.

Bronze Medals, with Special Approbation	2
Bronze Medals	20
Honorable Mention	44
Total awards	66

Being at the rate of about 43.14 per cent upon the number of Exhibitors, (153,) exclusive of those in the 1st Class (Mineralogy,) whose Contributions were not exhibited

W. ANTROBUS HOLWELL,
Commissioner for Canada,
New York Industrial Exhibition.

No.	Description of Invention,	Name of Patentee.	Date of Letters Patent.
430	Apparatus ... ... For disiccating Lumber, &c.	Nathan Buchanan... ...	October 6, 1853.
148	Do (Cooking). ... Revolving Flue as applied to	Alex. Carpenter	February 17, 1834.
273	Do ... ... For Cutting Mens Boots, &c.	J. H. Sampson, ...	March 6, 1850.
427	Do ... ... For Crushing, Drying, and Preparing Potatoes, Fruits, &c	Masa B. Southwick, ...	Sept. 15, 1853.
298	Do ... ... For warming air for heating houses, green houses, malt drying	Oliver Tiffany, ...	October 30. 1850.
382	Do ... ... Improved for warming air, for warming and ventilating houses, &c....	Fredk. Tiffany, ...	November 6, 1852.
131	Do ... ... For taking off the friction of the axle of a Bell, &c.	Geo. P Warren, ...	August 14, 1848.
275	Ashes Safe ... ... A portable, and Stationary	Alex. Carpenter, ...	March 13, 1850.
260	Accoucheurs Assistant ... To enable Doctors and others to confine females in a sitting position	Chas. Midgley, ...	August 13, 1849.
	Air Distributer or Grate ... For Burning saw dust, peat, turf, coal, &c , in stoves	Ananias Smith	January 30, 1849.
51	Archimedian Screw ... Improvement upon Smith's Patent	Nelson Walker, ...	March 24, 1841.
44	Bridges Wooden ... ... Applicable to Rapids, Streams, &c.	Samuel and S. R. Andres,...	February 4, 1837.
32	Do Suspension ... A new mode of constructing	Nicol. H. Baird, ...	April 29, 1833.
	Do do ... ... Method of constructing on combined principles, the Suspension Wooden	Nicol. H. Baird, ...	July 14, 1831.
28	Do ... ... Improvemant in the building of...	Amable Duchaine	Novr. 30, 1831.
16	Do ... ... New method of constructing Timber	John G. Howard	February 24, 18-0
310	Do and Roofs... ... Suspension truss to be applied in building	John Kiely,...	March 22, 1851.
105	Do ... ... Improvements in constructing Wooden	Stephen Mil's, ...	Novr. 28, 1846.
4	Do ... . Constructing Suspension	G. W. Wickstead, ...	October 31, 1835.
119	Bricks ... ... Machine for receiving and removing from the moulds	Austin Adams, ...	August 14, 1847.
239	Do ... ... An improved machine for making	John Butter, ...	May 2, 1848.
212	Do ... . New Machine for making	David J. Ellis, ...	April 25, 1846.
24	Do ... ... Mode of making Bricks and Architectural Ornaments	James McLaren	January 8, 1852.
43	Do .. .. Machine for Making	John Parsons, ...	October 6, 1853.
18	Biscuits and Crackers ... Machine for manufacturing	Samuel Andres, Jr., ...	January 3, 1831.
406	Baking purposes ... ... A double Reflector for	John Dean,...	April 29, 1853.
425	Do ... ... Improvement on the above	John Dean,...	Septr. 7, 1853.
217	Blacksmiths' Forges ... A new description of Fire iron for	Wm. T. Barnes, ...	October 21, 1846.
28	Blast Regulator ... ... An improved apparatus for	Jacob Barnes, ...	June 13, 1850.
28	Blacksmiths' Forges .. Smiths' Forges	Jacob Barnes, ...	
23	Bellows ... ... Improvement in the manufacture of	Joseph Westman, ...	May 9, 1847.
287	Bee Hive ... . The self protecting Bee Hive	Albert Bennett, ...	June 12, 1850.
38	Do ... . An improved	Charles Midgley, ...	October 27, 1852.
10	Do ... ... New method of constructing	Amos Tyler, ...	Septr. 26. 1846.
224	Boilers Setting ... ... Setting of and arranging flues for Steam Engines...	Daniel Cleal, ...	January 23, 1847.
24	Do Steam Engine ... Improvement in construction, of	John C. Douglas, ...	Septr. 27, 1831.
112	Do Steam .. ... Double Revertable Flue Steam Generator	Horace H. Davison, ...	April 19. 1847.

No	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
228	Boilers, Steam ... ... Double Revertable Flue Steam Generator	Horrace H. Davison,	April 10, 1847.
123	Baths, Shower ... ... Improved method of making	Michael Dwyer,	Novr. 10, 1847,
178	Do ... ... The Circumfluent	Wm. Halwell,	July 16, 1842.
76	Balance Machines ... ... Method of constructing Counter	Ebenezer Gilbert,	May 21, 1845.
197	Do ... ... Do do	Ebenezer Gilbert,	June 25, 1845.
37	Do ... ., An improved weighing	Otis Warren,	June 30. 1834.
408	Bridle Rein .. .. An improved called "The Duplex Safety."	Wm. A. Holwell,	May 12, 1853.
107	Ban Boxes ... ... Machine for making	Louis Lemieux,	January 25, 1847.
421	Burial Case... ... ... A Metallic...	Calvin P. Ladd,	July 8, 1853.
213	Battery, Revolving... ... Inventor of the	Wm. McLean,	May 26, 1846.
434	Beer Apparatus ... ... For cleansing and drawing off...	John Parsons,	October 13, 1853.
131	Bell, Action of ... ... Apparatus for taking off the friction	Geo. P. Warren,	August 14, 1848.
308	Bedstead ... ... Improvement on old Patent Bedstead for the Sick and Wounded	Joseph Watson,	January 31, 1851.
273	Boots, Mens ... ... Apparatus for Cutting	James H. Sampson,	March 6, 1850.
18	Crackers and Biscuits ... A machine for manufacturing	Samuel Andres, Jr.,	January 3, 1831.
21	Chain, Endless ... ... For propelling various kinds of machinery	S. & S. R. Andres,	March 14, 1831.
67	Clay (grinding) ... ... Machine for...	Austin Adams,	January 8, 1844.
165	Clay Slates ... ... Machine for manufacture of	James Ainslie,	August 21, 1840.
208	Clay Presses ... ... For making Bricks, Tiles, &c.	Geo. K. Burrrows,	February 27, 1846.
364	Chimneys and Flues ... Scientific mode of constructing	Samuel Andres,	August 12, 1852.
386	Churn ... ... Centrifugal and Centripetal	Geo. Ainsley,	February 8, 1853.
86	Churn ... ... For making butter	Jasper Ball,	January 7, 1846.
92	Churn ... ... New method of making	Ephraim Duell,	May 6, 1846.
233	Churn ... ... An improved	Peter Fraer,	June 26, 1847.
359	Churn ... ... The Reciprocating	Benjamin Gumear,	June 15. 1852.
361	Churn ... ... Improved called the Propeller...	Peter Row Higley,	August 30, 1849.
370	Churning and Washing ... New machine for	Richd. Lossing,	August 31, 1852.
379	Churn ... ... An improved	has. Midgley,	October 27. 1852.
236	Churn ... ... New description of	Melzer T. Thomas,	Decr. 13, 1847.
135	Churn ... ... Called the Aeriform and Atmospheric	Walter H. Wells,	Novr. 13, 1848.
252	Churn .. .. Do do	Walter H. Wells,	Novr. 17, 1848.
349	Churn ... ... An improved	Asa Willard,	January 23, 1852.
39	Cement, Water ... ... New method of making	Fredk. Henry Baddely,	October 9. 1834.
138	Calendar ... ... New Office Sliding	John P. Bostwick,	Novr 20, 1848.
148	Cooking Apparatus ... Revolving flue as applied to	Alex. Carpenter,	February 17, 1834.
154	Cooking Stove .. ... Upon new and different principles	James Cahill,	June 1, 1853.
307	Do Range ... ... Prowsonian Hot-air Furnace, or	Geo. F. Prowse,	January 7, 1851.

4	Cylinder	... Single and double Drum for manufacture of Ropes, Cables, &c.	R. Dalkin, ...	Nov 30, 1825.
375	Carriage Wheels ...	... Improved machine for making...	Edward C. Ennis, ...	Sept. 30, 1852.
66	Do Springs ...	... New method of constructing	Edward Gingras, ...	Sept. 16, 1843.
128	Do Four Wheel	... Plan for facilitating turning in a short space	Edward T. Jones, ...	June 27, 1848.
24	Do do	... Do do	Edward T. Jones, ...	June 23. 1846.
271	Do Spring ...	... An Improved	Daniel Mandigo, ...	January 22, 1850.
350	Do Four Wheel	... Improved method of constructing	Justus L. Jones, ...	March 20, 1852.
342	Do Spring ...	... New method of constructing	Thomas Mills, ...	Novr. 25, 1851.
420	Do Springs ...	... Improvement in manufacture of	Geo. Urquhart, ...	July 20, 1853.
268	Capstans	... Improved called Gilmour's Patent	John Gilmour, ...	Decr. 11, 1849.
199	a stans	... Ives connected	Lewis Ives,...	July 16, 1848.
421	Coffin	... Metallic Burial Case	Calvin P. Ladd, ...	uly 8, 1853.
16	Clover Seed Machine	... For threshing grain and hulling clover Seed	John Manning, ...	Novr. 1. 1830.
19	locks	... Improved Striking	John McCann, ...	March 1, 1831.
30	Chromatometer ...	... Newly invented	Theodore F. Molt, ...	April 6. 1832.
108	Cistern	... Improved apparatus for constructing	Johnathan B. Massey, ...	April 3, 1847.
325	Cider Mill Press ...	... Improved mode of constructing...	John H. McKenzie, ...	June 16, 1851.
394	Corn Crusher ...	... A machine for crushing grain	James Russell, ...	April 15, 1853.
373	Do Cracker ...	... Improved method of constructing	Geo. M. Sperry, ...	Sept. 21, 1852.
36	Do Cribble ...	... For separating Indian peas from wheat...	Joel Spalding, ...	June 30, 1834.
323	Cross Cutting ...	... Improved machine for	Chester Shattuck, ...	May 21. 1851.
171	Comb, Expanding ...	... New mode of constructing for Steam Engines	Chas. M. Tate, ...	January 21, 1842.
156	Charcoal	... New method of producing from wood	Jos. Van Norman, ...	January 29, 1836.
41	Cant Hook	... For piling and disposing of Railway Iron Bars	Joseph Woods, ...	May 28, 1853.
68	Drying Kiln ...	... New and improved revolving	Hiram Bigelow, ...	January 9, 1844.
18	Do	... For drying wheat and other grain	Hiram Bigelow, ...	Sept. 29, 1843.
360	Drill Seed	... Improvement in the	Lawrence Hager, ...	June 30, 1852.
39	Do	... Improved to be attached to a Plough	Peter Murdoch, ...	April 15, 1853.
62	Drilling Machine ...	... For boring holes in Rock, Quarries, &c....	Donald A. McDonald, ...	Decr. 19, 1842.
272	Do	... New and improved	Wm. Nixon, ...	February 28, 1850.
205	Distillation	... On a principle not hitherto known	John Maitland, ...	August 12, 1845.
240	Ditching Machine ...	... New and improved	Wm. Partridge, ...	April 22, 1848.
21	Endless Chain ...	... For propelling various machinery	S. and S. R. Andres, ...	March 14, 1831.
19	Engine Pump ...	... Improvements on Fire Engines, &c.	John Hearle, ...	June 29, 1844
309	Do do ...	... Do do	John Hearle, ...	January 31, 1851.
5	Do Lever ...	... ...	Jacob Justine, ...	October 31, 1826.
432	Excavator	... For cutting or excavating clay, gravel, sand, &c.	Robert E. Stephens, ...	October 6, 1853.
367	Elevator	... Machine called Trenholm's Elevator	Edward Trenholm, ..	August 26, 1852.
47	Fireproof Safe ...	... Applicable to vaults, cells, gaols. &c.	S. and S. R. Andres, ..	April 1, 1837.
111	Fire Extinguishers	... Invention for constructing Portable	Wm. Armstrong, ...	May 3, 1847.
196	Do	... Do do do	Wm. Armstrong, ...	Sept. 3, 1844.
19	Fire Engine ...	... Improvement on the Engine Pump	John Hearle, ...	June 29, 1844.
309	Fire do	... Do do	John Hearle, ...	January 31, 1851.
64	Fire do	... For Extinguishing Fires	Louis Lemoine, ...	June 1, 1843.
122	Fire do	... Mode of constructing bed plates of End working Fire Engines	Wm. Muir.	October 27, 1847.
186	Fires	... Composition for preventing and Extinguishing	John Montgomery, ...	August 9, 1843.

No.	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
354	Fire Engine ... ... A direct action	Vm. Perry,....	April 30, 1652.
87	Fire do or ... ... House Pump new of constructing	Albert Young, ...	February 26, 1846.
207	Fire do ... ... Do do	Albert Young	February 14, 1846.
364	Flues and Chimneys ... Scientific mode of constructing...	Samuel Andres, ...	August 12, 1852.
41	Fermentation ... ... A discovery in the process of	Samson Buttery, ...	Novr. 4, 1835.
415	File Cutting ... ... New machine for	Jackson McIntyre,... ...	June 20, 1853.
59	Fishing Netts ... ... A machine for fishing Eels	Edouard Belanger,... ...	August 25, 1842.
404	Fanning Mill ... ... Improvement in constructing of	Daniel P. Brigham,... ...	April 29, 1853
276	Do ... ... Do do	F. G. Wilson, ...	March 13, 1850.
1	Fulling Machine ... ... For washing and Fulling	Noah Cushing, ...	June 8, 1842.
8	Flax and Hemp ... ... Improved machine for dressing	Robert Hoyle, ...	October 3, 1829.
118	Do ... ... New method by rotting by artificial means	James McGee, ...	August 6, 1847.
235	Do ... ... Do do do	James McGee, ...	August 14, 1847.
116	Flour Sifter... ... ... New method of constructing	E. S. De Rottermund, ...	August 26, 1847.
103	Furnaces, Hot Air... ... For generating heat in dwellings, &c.	John Mills....	October 10, 1846.
120	Do do .. ... New method of constructing	Geo. F. Prowse, ...	Sept. 11, 1847.
307	Do ... ... Prowsonian Hot Air Cooking Range	Geo. F. Prowse, ...	January 7, 1851.
344	Do ... ... An Improved	Jos. Pagnuelo, ...	January 8, 1852.
98	Do ... ... New method of constructing	Henry Ruttan, ...	August 23, 1846
15	Grist Mill ... ... An Improved	Samuel Andres, Jr., ...	October 25, 1830.
296	Do do .. .. Improvement in construction of Portable	David Kidd, ...	October 14, 1850.
23	Do do ... ... A new and useful	Uriah Daily, ...	April 7, 1831.
117	Do do ... . New mode of constructing	E. S. De Rottermund, ...	August 26, 1847.
96	Do do ... ... For grinding grain, &c.	Noah Shaw, ...	August 3, 1846.
67	Grinding Clay ... ... A machine for	Austin Adams, ...	January 8, 1844.
346	Grain Separator ... ... For cleaning grain and separating it from straw and chaff...	Alex. Anderson, ...	January 19, 1852.
17	Do Threshing ... ... A machine for	Amos Austin, ...	January 3, 1831.
22	Do do .. ... A useful machine for...	Edouard Belanger, ..	March 30, 1831.
394	Do Crusher ... ... A machine for crushing grain and corn...	James Russell, ...	April 15, 1853.
14	Gauge, or ... ... Instrument to ascertain Tonnage, &c.	Samuel Andres, Jr., ...	August 9, 1830.
9	Gas generator ... ... For generating gas	Colby Harrison, ...	June 22, 1846.
221	Do do ... ... Improvement in the	Colby Harrison.	Dec. 12, 1846.
362	Do Illuminating ... ... New mode of purifying	Abraham Longbottom, ...	July 29, 1852.
424	Do Light ... ... Mode of producing from Oil, &c.	Alexis Robitaille, ...	Sept. 2, 1852.
192	Gate... ... ... The self propelling	Frederick Hutt, ...	January 27, 1844.
246	Glue... ... ... Improved method of making	Peter R. Lamb, ...	June 26, 1848.
400	Gun Barrel... ... ... An improved Gun barrel and projectile	Wm. C. Ruttan, ...	April 29, 1853.

254	Grate or Air Distributor	For burning saw dust, peat, turf, &c., in stoves	Ananias Smith,	January 13, 1849.
165	Guard Propeller	An improved	Nelson Walker,	January 15, 1852.
18	Hat bodies	Machine f r manufacturing	Samuel Andres, Jr.,	August 9, 1830.
347	House building	Improved plan for	James Anderson,	January 19, 1852.
129	Hay Rake	New method of constructing	Antipas M. Byron,	June 19, 1848.
136	Do do	Coil spring tooth revolving Horse	Peleg Bowen,	Novr. 14, 1848.
237	Do and Grain do	Do do	Peleg Bowen,	Decr. 13, 1847.
349	Do and Straw	An improved machine for cutting	Peter R Higley,	Novr. 6, 1851.
388	Do and do	Do do	Peter R. Higley,	March 7, 1853.
322	Hay, Straw, &c.	Improved machine for cutting	Daniel Mandigo,	May 2, 1851.
30	Hay and Straw	Box for cutting	Ithamar P. Smith,	Decr. 7, 1850.
8	Hemp and Flax	Improved machine for dressing	Robert Hoyle,	October 3, 1829.
118	Do and do	New method of rotting by artificial means	James McGee,	August 6, 1847.
235	Do and do	Do do	James McGee,	August 14, 1847.
95	Hoisting Machine	New method of constructing	G. W. Johnson,	June 24, 1846.
215	Do do	For lifting heavy materials into stores, &c.	G. W. Johnson,	June 26, 1846.
103	Hot Air Furnace	For generating and diffusing heat in dewellings, &c.	J hn Mills,	October 10, 1846.
216	Heated Air Generator	Do do do	John Mills	Sept. 1, 1846.
57	Do Air	For propelling vessels by acting on the fluid in which they float	Isaac G. Ogden,	June 27, 1842.
187	Do do	For propelling vessels and other floating bodies by heated air gasses, &c.	Isaac G. Ogden,	August 14, 1843.
120	Hot Air Furnace	New method of constructing	Geo. F. Prowse,	Sept. 11, 1847.
210	Do do	For heating buildings, &c.	Henry Ruttan,	May 2, 1846.
298	Do Apparatus	For heating houses, green houses, &c.	Oliver Tiffany	October 30. 1850.
382	Do do	Improved for heating houses, &c.	Fredk. Tiffany,	Novr. 6, 1852.
189	Do do	New mode of applying in cooking	Alex. Carpenter,	October 10, 1843.
245	Hydraulic Force Pump	A power machine for raising buildings, pumps, &c.	Angus McQueen,	June 24, 1848.
251	Hinge	New and useful	Chas. Aidgley,	August 2, 1849.
305	Horse shoes	Improved method of making	Thos. H. McLean,	Decr. 9, 1850.
324	Do do	New shape of bar for	Thos. H. McLean,	May 1, 1851.
140	Do swing	A limited lb	Nirum W. Rockwell,	February 5, 1849.
412	Do do	New limited	Nirum W. Rockwell,	June 11, 1853.
251	Do Power	Application to threshing Machines, and other kinds of machinery	James Stewart,	October 14, 1848.
12	Do Collars	New mode of constructing	Wm. Walsh,	January 8, 1848.
374	Harrow	New and improved	Samuel J. Russell,	October 8, 1852.
415	Harvesting Machine	Improvements in construction of	Chas. W. Smith,	June 20, 1853.
78	Harmonic Attachment	For Piano Fortes	Samuel R. Warren,	July 9, 1845.
28	Heater of Water	And liquids, improved method of	Alfred Wilbur,	March 25, 1850.
36	Iron, Smoothing	Improved draft and damper box	Geo. W. Lester,	August 24, 1852.
35	India Rubber	For rendering linens and woollens, cottons, &c., impervions to water	James McKenzie,	January 19, 1834.
9	Ink Machine	For distributing Ink over Printing Types	Wm. John Spence,	Decr. 19, 1829.
262	Japan Varnish	Improved called "Chemical Elastic"	Daniel Mandigo,	August 31, 1849.
319	Joint	Rabitted revolving air and water-tight	Thos. S. Fox,	April 12, 1851,
68	Kiln, Revolving Drying	New and improved	Hiram Bigelow,	January 9, 1844.
188	Do	Do	Hiram Bigelow,	Sept. 29, 1843.
91	Knitting Loom	Improved in construction of	Jonas P. Lee,	June 4, 1846.
321	Do	Called the self acting ribbed warp	John Rourk,	May 1, 1851.

No	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
43[illegible]	Lumber ... . Apparatus for disiccating lumber, &c.	Nathan Buchanan,... ...	October 6, 1853.
35[illegible]	L mp ... ... For burning Benzole or Hydro carbons	Samuel Cutter, ...	April 19, 1852.
11[illegible]	Do Fluid .. ... Method of compounding	Horace H. Davidson, ...	April 15, 1847.
226	Do do ... ... Improved Portable	Horace H. Davidson, ...	April 10, 1847.
23	Do and Chandeliers ... Composition for producing light	John Ratcliff, ...	October 3, 1831.
407	Ladders ... ... New and improved	Zenas Everitt, ...	May 12, 1853.
232	Locomotives ... ... New method of propelling	Sanford A. Fleming, ...	June 4, 1847.
294	Do ... ... Improvement in principle of propelling along inclined planes	Henry Trout, ...	October 7, 1850.
27	Lever Power ... ... An improvement in the	Hugh Henry, ...	Novr. 19, 1831.
5	Lever Engine ... ... Improved	Jacob Justin, ...	October 31, 1826.
42	Lime Water ... ... Composition of matter called	Elisha W. Harrington, ...	February 20, 1836.
91	Loom Knitting ... ... Improvement in construction of	Jonas P. Lee, ...	June 4, 1846.
321	Do do ... ... Machine called the self acting ribbed warp knitting loom	John Rourk, ...	May 1, 1851.
340	Laths .. .. Improved machine for making...	Peter R. Lamb, ...	Novr. 6, 1851.
390	Lightning Rods ... ... An improvement in construction of	Daniel Mandigo, ...	February 16, 1853.
391	Do Constructors ... Improvement in	Albert Rounds, ...	February 16, 1853.
397	Leather ... ... Process of manufacturing it from skin of the Whale or Porpoise	Chas H. Têtu, ...	April 16, 1853.
15	Mill, Grist ... ... An improved	Samuel Andres, Jr., ...	October 25, 1830.
279	Do do ... ... An improved	David P. Bonnell, ...	March 20, 1850.
404	Do Fanning ... ... Improvement in construction of	Daniel P. Brigham, ...	April 29, 1853.
23	Do Grist ... ... New and improved	Uriah Daily, ...	April 7, 1831.
117	Do do ... . New mode of constructing	Edmond S. De Rottermund	August 21, 1847.
368	Mully Saw Mill		
368	Mill, Mully's Saw ... ... Improvement in manufacture of		
242	Mill Saw ... ... Improved for manufacture of Lumber with Circular Saws....	Thos. J. Fuller, ...	August 31, 1852.
284	Do Fanning ... ... Improvement in construction of the	John Helm,...	June 24, 1848.
290	Do do ... ... Further improvement in do.	Lous Houck, ...	May 27, 1850.
296	Do Grist... ... ... Improvement in the Portable	Lonis Houck, ...	July 22, 1850.
405	Do Saw ... ... New self regulating	David Kidd, ...	October 14, 1850.
325	Do Cider... ... ... New mode of constructing	Asaph B Kent, ...	April 29, 1853.
409	Do Saw ... ... Improved Apparatus for steam and water	John H. McKenzie, ...	June 16 1851.
211	Do Stones ... ... New mode of making...	Daniel S. Merritt, ...	May 11, 1853.
127	Do Saw ... ... For Slabbing logs, &c.	Richard H. Oates,... ...	April 25, 1846.
		John Ritchie, ...	June 19, 1848.
152	Do do ... ... Apparatus for effecting the fixing and setting logs	Martin Rich, and W. Jackson, ...	April 28, 1835.
366	Do Stone pickers ... Certain Instruments called	John Rourk, ...	August 24, 1852.

96	Mill Grist... ...	... For grinding grain, &c.	... Noah Shaw.	August 3, 1846.
160	Do Saw	... Application of Lever to gear of	... Duncan Scringer, ...	May 10, 1839.
334	Do do	... Improved method of running perpendicular saw	... James Trehearne, ...	August 21, 1851.
276	Do Fanning ...	... Improvement in the	... Francis G. Willson, ...	March 13, 1850.
234	Marine Dock ...	... Improvement in working a lifting and floating	.. P. R. Beaupre, ...	July 19, 1847.
177	Do Railway ...	... Improved method of constructing	... Thos. Dissett and J. Smith,	May 16, 1842.
339	Moulding Machine	... Improved circular and straight for rabitting, &c....	... Wm. Coleman, ...	Novr. 6, 1851.
190	Mangle	.. For mangling cloths	... Geo. J. Mackelcaw, ...	Novr. 24, 1843.
181	Malt Liquors ...	... Improved method of brewing	... Geo. Riley,...	July 6, 1842.
222	Metal Heater ...	... For houses and other buildings	... Henry Ruttan, ...	Decr. 15, 1846.
48	Matching and Plaining	... Improved machine for	... Zebediah Sisson, ...	June 13, 1839.
273	Mens Boots... ...	... Apparatus for cutting...	... Jas. H. Sampson, ...	March 6, 1850.
2	Nails	... A machine for cutting	... Isaac J. Bernard, ...	July 21, 1824.
59	Nets Fishing ...	... A machine for fishing Eels	... Edouard Belanger, ...	August 25, 1842.
113	Do do ...	... Apparatus for raising	... Louis Lemoine, ...	April 6, 1847.
53	Do Seine ...	... For the captuure of Porpoises...	... Moïse Morin, ...	August 5, 1840.
84	Do	... Improved for taking Seales and Porpoises	... Moïse Morin, ...	October 15, 1845.
302	Nuts and Washers...	... Improved machine for making	... Daniel M. Lamb, ...	Decr. 28, 1850.
138	Office Sliding Calendar	... New and useful	... John P. Bostwick,... ...	Novr. 20, 1848.
115	Oil paints	... Preparation for all kinds of, for house painting, &c.	... Peter Deal,...	August 7, 1847.
398	Oils	... New mode of manufacturing whale and Porpoise.	... Chas. H. Têtu, ...	April 16. 1853.
283	Obstetrical Supporter	... Improved method of constructing	... John C. Loyd, ...	May 27. 1848.
269	Ploughs	... Improved called the "Lion Plough"	.. Wm. Arms, ...	Decr. 28, 1849.
417	Do	.. Improvement in the construction of	... Jno. W. Armstrong, ...	June 21, 1853.
387	Do	... Useful improvement in the Wooden	.. Ezekiel Burley, ...	February 14, 1853.
285	Do	... Fleck's new and improved	... Alexr. Fleck, ...	March 25, 1850.
297	Do	... Improvement in the Agricultural	... Samuel Hurlbert, ...	October 17, 1850.
301	Do	... An improved	... James Hamilton, ...	Decr. 13, 1850.
313	Do	... New and improved	... William Holton, ...	March 15, 1851.
371	Do	... Improvement on his Patent of 17th October, 1850.	... Samuel Hurlburt, ...	Sept. 20, 1852.
361	Do	... Improvement in the Canadian Plough	... William Knaggs.	June 30, 1852.
206	Do	... New method of making cast Iron	... Jenkins Lloyd, ...	January 17, 1846.
330	Do	... Double Iron beam	... Charles Lemon, ...	January 24, 1851.
352	Do	... Improved method of constructing	... Charles Lemon, ...	March 31, 1852.
396	Do	... Do do	... Charles Lemon, ...	April 15. 1853.
270	Do	... Mandigo's improved	... Daniel Mandigo, ...	January 30, 1850.
333	Do	... Improvements in construction of	... Henry Markle, ...	July 12, 1851.
414	Do	... Improved Mould board for the	... John Morley, ...	June 20, 1853.
431	Do	... Improvements in construction of	... Isaac Moreland, ...	Sept. 19, 1853.
317	Do	... Improvement in the	.. Archd. J. Thompson, ..	March 24, 1851.
429	Do	... Improvement in constructing the Canadian	... Alex. Turnbull, ...	October 5, 1853.
425	Potatoes	.. Machine for planting	... Alex. Anderson, ...	Sept. 15, 1853.
427	Do	.. Apparatus for crushing, drying, &c.	... Masa B. Southwick, ...	Sept. 15, 1853.
201	Do Digger ...	... Improved machine for digging...	... William Watts, ...	July 19, 1845.
79	Do do ...	... Do do	... William Watts, ...	July 19, 1845.
77	Paddle Wheel ...	... The Sweeping Paddle Wheel...	... Nicol H. Baird, ...	May 30, 1845.

No.	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
176	Paddle Wheel ... ... The Sweeping Paddle Wheel	Nicol H. Baird, ...	January 12, 1842.
166	Do ... ... For propelling Steam or other Vessels	Richard D. Chatterton, ...	June 22, 1841.
56	Do ... ... Osculatory Propeller	Peter Fleming, ...	March 12, 1842.
174	Do ... ... Do	Peter Fleming, ...	March 7, 1842.
132	Do ... ... For Steam and Horse Boats	Chas. Midgely, ...	August 10, 1848.
161	Do ... .. Improvements in the Steamboat Paddle	Geo. J. McKelcan, ...	February 8, 1840.
164	Do ... ... Further improvements in do.	Geo. J. McKelcan,... ...	May 29, 1840.
253	Do ... ... For propelling vessels, horse and Steam boats	Chas Midgely, ...	January 27, 1849.
423	Do ... ... Improved self adjusting	Wm. J. Spence, ...	July 26, 1853.
422	Do ... ... Newly invented Paddle Box, Tubular Shaft	Robt. Thomas, ...	July 19, 1853.
179	Penstock's Water Wheel ... For application of water by a different method to that in general use	Jacob Baker, ...	Sept. 20, 1842.
208	Presses for Clay ... ... For making Bricks, Tyles, &c....	Geo. K. Burrows, ...	February 27, 1846.
402	Press ... ... For manufacture of earthenware pipes, &c.	David Bell....	April 29, 1853.
115	Paints ... ... Preparation for all kinds of oil for house painting, &c.	Peter Deal....	August 7, 1847.
303	Pump, Water ... ... An improved for raising water	Eusèbe Dupont, ...	Decr. 17, 1850.
182	Pump ... ... Improvement upon the Suction and Forcing	Asa H. Hough, ...	February 20, 1843.
243	Pump, Hydraulic Force ... For raising buildings, stumps, &c.	Angus McQueen, ...	June 24, 1848.
70	Pump, (Ship) ... ... Improved called the "Seaman's Friend"	Thos. Proudlock, ...	October 16, 1844.
265	Do Reaction ... ... New description of	John Winger, ...	Sept. 28, 1849.
87	Do House, or ... ... Fire Engine, new mode of constructing	Albert Young, ...	February 26, 1846.
207	Do House ... ... Do do	Albert Young, ...	February 14. 1846.
155	Planing Machine ... ... For preparing boards, &c., for use	Samuel and L. Judson, ...	March 5, 1853.
97	Do ... ... Do do	Chas. Midgeley, ...	August 10, 1846.
48	Do and Matching... An improved machine for	Zebediah Sisson, ...	June 13, 1839.
144	Do Machine ... For plaining and grooving boards, &c.	Zebediah Sisson, ...	June 27, 1832.
389	Do ... ... Do do	A. A. Wilder, ...	March 7, 1853.
419	Do and Sawing .. For sawing and planing by one operation	Alex. S. Walbridge, ...	June 20, 1853.
49	Plaster of Paris ... ... New method of grinding	J. McKenzie & T. Bowles...	August 7, 1839.
71	Piano Fortes ... ... New method of constructing	Geo. Milligan, ...	Novr. 21, 1844.
306	Do ... ... Improved do do	Geo. H. Mead, ...	January 8, 1851.
163	Do ... ... Do do do	F. J. Morgan, & A. Smith,..	March 23, 1840.
78	Do ... ... Harmonic Attachments for	Samuel R. Warren, ...	July 9, 1845.
57	Propelling Vessels... ... By means of heated air acting on the fluid in which they float	Isaac G. Ogden, ...	June 27, 1842.
74	Do ... .. By machinery without fuel	Jean F. C. Ouellet, ...	March 26, 1845.
187	Do ... ... Machine for propelling vessels by heated air gasses, &c.	Isaac G. Ogden, ...	August 14, 1843.
156	Propelling Engine ... ... New mode of propelling vessels and carriages	Edwin A. Talbot, ...	July 18, 1834.
170	Propeller ... ... Giving motion and efficacy to that used in Steamboats, &c.	Chas. M. Tate, ...	January 13, 1842.

55	Do	Improvement on his Patent of 24th March, 1841, see Archimedian Screw	Nelson Walker,	January 18, 1842.
169	Propeller Guard	Improved	Nelson Walker,	January 15, 1852.
129	Rakes Hay	Method of constructing	Antipas M. Byron,	January 19, 1848.
136	Do do	Coiled spring tooth Revolving Horse	Peleg Bowen,	Novr. 14, 1848.
237	Do do and Grain	Do do do	Peleg Bowen,	Decr. 13, 1847.
381	Do Grain	Improvement in making grain	Wm. Brown,	Novr. 6, 1852.
202	Do	Revolving Horse Rake	John Harris,	August 4, 1845.
106	Do	Improved revolving joint tooth spring Lever horse Rake	Jos. Paradee,	October 8, 1846.
218	Do	Revolving joint tooth Horse Rake	Jos. Paradee,	Sept. 24, 1846.
80	Do	Improved for hay and grain	Albert Young,	August 22, 1845.
204	Do	Improved metallic coiled spring tooth Horse Rake	Albert Young,	August 16, 1845.
183	Rotary Steam Engine	An improvement in the	Wm. Creighton,	March 31, 1843.
6	Rotary Calculator	To ascertain the No. revolutions of carriage wheels and millstones.	Chas. Laurier,	October 31, 1826.
435	Railway Trains	Machinery for arresting the Progress	Dalrymple Crawford,	October 15, 1852.
177	Do Marine	Improved mode of constructing	T. Dissett and Jas. Smith,	May 16, 1842.
3	Railroads Roads	Improvement in the construction of Wooden	James George,	Decr. 13, 1824.
355	Railway Carriages	Self-acting Apparatus for disconnecting	Thos. C. Gregory,	May 28, 1852.
99	Railroad Cars	Improved coupling machines for	Amos Tyler,	Sept. 26, 1846.
101	Do Track	Snow excavator	Amos Tyler,	Sept. 26,
410	Railway Iron Bars	Cant hook for handling, disposing, &c.	Jos. Woods,	May 28, 1853.
4	Ropes, Cables, &c.	Improvement in the Cylinders used in the manufacture of	Robert. Dalkin, Jr.,	Novr. 30, 1825.
406	Reflector, Double	For baking purposes	John Dean,	April 29, 1853.
425	Do	Improvement in do	John Dean,	April 7, 1853.
408	Reins or Bridles	Improvement in called the "Duplex Safety."	Wm. A. Holwell,	May 12, 1853.
376	Roofs and Bridges	New kind of Suspension Truss to be applied in building	John Kiely,	March 22, 1851.
213	Revolving Battery	Newly invented	Wm. McLean,	May 26, 1846.
392	Running Gear	Improved for Vehicles	Pr. Murdoch,	April 15, 1853.
265	Reaction Pump	A new description of	John Winger,	Sept. 28, 1849.
43	Springs, Steel	To be used as a propelling power	Samuel Andres, Jr. and	
43	Steel Springs	Do do	Stephen R. Andres,	February 7, 1837.
66	Springs, Carriage	New method of constructing	Ed. Gingras,	Sept. 16, 1843,
420	Do do	Improved metallic	Geo. Urquhart,	July 20, 1853.
45	Safe Fire proof	Applicable to Vaults, Cells, &c.	S. & Stephen R. Andres,	April 1, 1837.
275	Safe, Ashes	Portable and Stationary	Alex. Carpenter,	March 13, 1850.
58	Smut Machine	For cleaning grain, &c.	Wm. Arms,	July 26, 1842.
125	Do Mill	Do	Thos. Brown,	March 16, 1848.
238	Do do	Do	Thos. Brown,	March 2, 1848
159	Do Machine	Do	Wm. White,	February 23, 1837.
165	Slates Clay	Mode of manufacturing	James Anestie,	August 21, 1840.
289	Stoves, Cooking	Improved cooking	Jas. R. Armstrong,	June 28, 1850.
320	Stove do	Giant cooking	Jas. R. Amstrong,	April 17, 1851.
393	Do do	Portable hot air and cooking	Geo. Ansley,	April 15, 1853.
157	Do do	Method of carrying off the Steam	Levi R. Brown,	April 15, 1836.
376	Do do	New and improved	Henry Bernier,	October 5, 1852.
154	Do do	Upon a new and different principle	Jas. Cahill,	June 1, 1835.
247	Do Air-tight Box	An improvement in the	Reuben P. Colton,	August 1, 1848.

No.	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
248	Stove, Cooking ... ... Improvement on Buck and Hathaway's	Reuben P. Colton,...	August 1, 1848.
277	Do Hot Air ... ... For cooking and heating	Isaac Carter, ...	March 13, 1850.
278	Do ... ... Summer and Winter ventilating air	Isaac Cartier, ...	March 13, 1850.
293	Do ... . New pattern and principle by Chas. Trip, (an American Citizen)	J. Counter, Assignee of C. Tripp, ...	March 28, 1850.
335	Do Cooking ... ... Hot air, from, applied to heating houses	Isaac Carter, ...	August 12, 1851.
336	Do do ... ... The Brockville Air Tight	Reuben P. Colton. ...	Sept. 8, 1851.
194	Do do ... ... Improvement in manufacture of	Wm. L. Distin, ...	June 29, 1844.
329	Do do ... ... The Salamander	Thos. J. Fuller, ...	June 18, 1851.
312	Do do ... ... Several improvements in the	Jas. R. Griffin, ...	March 13, 1851.
369	Do do ... ... Do do	Jas. R. Griffin, ...	Sept. 7, 1852.
278	Do the Double ... ... New mode of constructing	Chas. Goselin, ...	October 13, 1852.
145	Do Cooking ... ... Improved Hot Air	Jonathan G. Hathaway, ...	Decr. 24, 1832.
318	Stoves or Fireplaces ... Applying the heat to warm Apartments	Wm. J. Holmes, ...	April 12, 1851.
47	Stove pipes and Tubes ... New mode of constructing	Wm. P. Johnson, ...	June 8, 1838.
214	Do Cooking ... ... Useful improvements in the	Samuel S. Jones, ...	June 13, 1846.
326	Do ... ... For heating rooms, &c, (new)	S. S. Jewitt, ...	June 16, 1851.
60	Do Canadian Box ... Improvements in manufacture of	David A. Ross, ...	August 31, 1832.
225	Do ... ... Called a centre combustion and detached fire chamber for the admission of cold air	Henry Ruttan, ...	January 27, 1847.
311	Do Ventilator ... ... For admitting air under the floor	Henry Ruttan, ...	January 31, 1851.
72	Do ... ... Improvement in Vannovous' Patent	Jos. Smolenski, ...	Novr. 21, 1844.
46	Do ... ... New and useful	John Vannovous, ...	Novr. 7, 1837.
153	Do ... ... Improvement in the mode of applying heat to the oven	Jos. Van. Norman, ...	June 1, 1835.
158	Do Cooking ... ... New improvements in the	James L. Wilson, ...	January 26, 1837.
281	Do do ... ... An improvement in the	Alfred Wilbur, ...	March 25, 1850.
385	Scythe holder ... ... New and improved	Wm. Alchin, ...	January 26, 1853.
109	Do ... ... Improved Steel ring for fastening	Horace H. Davison, ...	April 14, 1847.
227	Do Ring ... ... Heel ring for fastening	Horace H. Davison, ...	April 10, 1847.
32	Suspension Bridge,.. ... New mode of constructing	Nicol H. Baird, ...	April 29, 1853.
40	Do ... ... New mode of constructing of wood or metal	G. W. Wicksteed,...	October 31, 1835.
34	Steam Vessel ... ... An improvement in construction of	Norman Bethune, ...	February 4, 1834.
38	Do ... ... A useful model for building	Norman Bethune, ...	August 14, 1834.
149	Do Ship... ... ... New method of building Steamships, Boats, &c., for navigating Seas, and Rivers.	Burlingham and Bewley, ...	Novr. 6, 1834.
151	Steam Vessel ... ... New method of Propelling	Thos. Graham, ...	March 25, 1835.
161	Steamboat Paddle ... ... Certain improvements in the	Geo. J. McKelcan, ...	February 8, 1840.
164	Do ... ... Further do	Geo. J. McKelcan, ...	May 29, 1840.
220	Steamboat Regulator ... A piece mechanism called the	Wm. McLean, ...	Decr. 17, 1846.

52	Steamboats and Vessels	New method of building of propelled by Paddle Wheels	Wm. Nums,	June 20, 1840.
147	Steam Vessels	Improvement in principle of building	Nathan Sandford,	May 23, 1834.
126	Saw Mill Machinery	Improvement in construction of	James Baillie,	April 12, 1848.
	Saw Gates	Saw Gates for Saw Mills		
242	Saw Mill	Improved for manufacture of Lumber with Circular Saws	John Helm,	June 24. 1848.
405	Do	Newly invented Self-regulating	Asaph B. Kent,	April 29, 1853.
267	Do	Improved method of constructing	Chas. Midgeley,	August 13, 1849.
127	Do	For slabbing logs, &c.	John Ritchie,	June 19, 1848.
152	Do	Apparatus for setting and fixing logs	M. Rich and W. Jackson,	April 28, 1835.
401	Saw Machine	For straight and crooked wood	Edmond Richard,	April 29, 1853,
160	Saw Mill	Mulliplying Lever to working gear	Duncan Scringer,	May 10, 1839.
288	Do	New method of constructing	Jas. Trehearne,	June 27, 1850.
334	Do	Improved method of running perpendicular Saw	Jas. Trehearne,	August 21, 1851.
249	Saw Seeth	Process for tempering and hardening	Nathan Wharton,	August 1, 1848.
351	Saws Mully	Improvement in working	Chas. Dawson,	March 20, 1852.
368	Saw Mill	Improvement in Mully	Thos. J. Fuller,	August 31, 1852.
256	Steam Engine	Improvement in construction of the	John Baird,	May 5, 1849.
183	Do Rotary	An improvement in the	Wm. Creighton,	March 31, 1843.
224	Do	New method of setting boilers, flues, &c.	Daniel Cleal,	January 23, 1847.
24	Do Boiler	Improvement in construction of the	John C. Douglas,	Sept. 27, 1831.
112	Do	Double revertible Flue generator	Horace H. Davison,	April 19, 1847.
12	Do	An improved Hydraulic	Robert Hoyle,	June 25, 1830.
358	Steam	Apparatus for generating	Louis Lemoine,	June 9, 1852.
81	Steam Engine	For vessels, locomotives and machinery	Jas. McKay,	Sept. 10, 1845.
50	Do	Improvements in construction of	Wm. Nums,	Dec. 4, 1839.
85	Do	Improved	Benjamin F. Tibbetts,	Nov. 10, 1845.
171	Do	Improved combs for, called Expanding	Chas. M. Tate,	January 21, 1842.
411	Do	Improvement in construction of	Benjamin F. Tibbetts,	June 11, 1853.
205	Still	New and improved called combination	Jas. jr., and Chas. Cull,	Nov. 29, 1845.
89	Do	For distilling and rectifying spirits Liquors, &c.	Geo. Riley,	March 18, 1846.
104	Do	For distilling and rectifying spirits liquors	Geo. Riley,	March 18, 1846.
191	Do	New mode of distilling by steam	Geo. Riley,	Dec. 15, 1843.
266	Starch Surrendered	Improvement in the art of making	John A. Cull,	Sept. 24, 1849.
314	Do	Machines called Rouser and Bran washer to be used in making	John A. Cull,	March 17, 1851,
315	Do	Certain Improvements in making	John A. Cull,	March 17, 1851.
116	Sifter, (Flour)	New method of constructing	Ed. S. DeRottermund,	August 26, 1847.
14	Tonnage	A gauge or Instrument to ascertain	Samuel Andres, jr.,	August 9, 1830.
17	Threshing Grain	A machine for	Amos Austin,	January 3, 1831.
22	Do	Do	Edouard Belanger,	March 30, 1831.
175	Do Mill	New and useful description of	Mahlon Beach,	April 27, 1842.
7	Threshing and Winnowing.	Improved machine for	N. Cushing and R. Welton.	October 31, 1826.
143	Threshing Grain	Machine on a new principle for	Jno W. Cleghorne,	Sept. 13, 1831.
31	Do Machine	Improvement on those now in use	Ed. Jewett French,	Decr. 18, 1832.
388	Do do	For grain seed, &c.	Thos. J. Fuller,	Novr. 6, 1851.
418	Do do	An improved	John Handford,	June 21, 1853.
209	Do do	Improvement in horse threshing machines	Wm. MacKinley,	February 27, 1846.

No.	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
348	Threshing Mill ... ... An improved	Thos. and Prudent Nicol,..	January 14, 1852.
377	Do Machine... ... Improved	Jos. Paradis, ...	October 15, 1852.
399	Do do ... ... Do	Jos. Paradis, ...	April 29, 1853.
26	Do do ... .. For all kinds of grain and hay seed	John Ratcliff, ...	October 3, 1831.
416	Do do ... ... Improvement in the construction of	Seraphin C. Rodier, ...	June 20, 1853.
20	Do do ... ... New and improved	Fredk. Singer, ...	March 2, 1831.
141	Do do ... ... Improvement in the manufacture of	Elias J. Severance, ...	March 6, 1849.
251	Do do ... ... Application of horse power to threshing machines and other machinery	James Stewart, ...	October 14, 1848.
257	Do do ... ... Improvement in the manufacture of	Elias J. Severance. ...	May 5, 1849.
217	"Tue Iron ... ... A new description for Blacksmiths' Forges	Wm. T. Barnes, ...	October 21, 1846.
94	Towing Machine ... ... For towing Vessels up Rapids...	Jas. Campbell, ...	June 22, 1846.
403	Tobacco ... ... Machine for cutting without moistening	Jos. Plamondon, ...	April 29, 1853.
73	Truss ... ... Improvement in the	Chandos Hoskins, ...	June 29, 1847.
65	Do ... ... An improved	John O. Brown, ...	July 7, 1843.
184	Do ... ... Additional Improvements	John O. Brown, ...	July 5, 1843.
47	Tubes and Stove pipes ... Constructing them with thin metal	Wm. P. Johnson, ...	June 8, 1838.
114	Telegraph ... ... An improvement in the method of constructing the Electro Magnetic	Gilbert McMicken, ...	June 29, 1847.
231	Do ... ... The manner of working and applying certain improvements in the	Gilbert McMicken, ...	June 8, 1847.
295	Tyles ... ... Improved method of manufacturing Tyles for Houses, &c....	Jas. McLaren, ...	October 5, 1850.
274	Tanning Leather ... ... New process for	Thos. Penney, ...	March 6, 1850.
172	Do Hides ... ... New mode of performing the operation...	Chas. M. Tate, ...	January 7, 1842.
173	Tanin ... ... New mode of extracting it from bark	Chas. M. Tate, ...	January 27, 1842.
10	Timber Cutting ... ... Machine for cutting Timber into Shingles, Laths, &c.	Phillip Schoolcraft, ...	May 15, 1830.
249	Teeth of Saws ... ... Process of hardening and tempering	Nathan Wharton, ...	August 1, 1848.
34	Vessels Steam ... ... Improvement in construction of	Norman Bethune.	February 4, 1834.
38	Do ... ... Model for constructing	Norman Bethune, ...	August 14, 1834.
200	Do ... ... Improved method of loading and unloading Timber Vessels	Lewis Ives,...	July 19, 1845.
147	Do ... ... Improvement in the principle of building	Nathan Sandford, ...	May 23, 1834.
130	Ventilator Canadian ... For ventilating Buildings, &c....	Henry Ruttan, ...	July 25, 1848.
	Do ... Do do upon true Philosophical principles	Henry Ruttan, ...	June 23, 1848.
311	Ventilating Stove ... ... For admission of air under the floor, &c.	Henry Ruttan, ...	January 31, 1851.
39	Water Cement ... ... New mode of making	Fredk. H. Buddely, ...	October 9, 1834.
121	Water Wheels ... ... New mode of constructing "The Right and left Water Wheel	Thos. Brill,...	Sept. 3, 1847.
179	Do do and Penstocks. For the application of Water by different method to that in general use	Jacob Baker, ...	Sept. 20, 1842.
337	Do Wheel ... ... Improved whirlpool or pressure water power	Benjamin Fuller, ...	Nov. 6, 1851.
338	Do do ... ... Method of constructing a compound	Patrick Flynn, ...	Novr. 8, 1852.
63	Do do ... ... Improved	John Lamb, ...	April 3, 1843.

180	Water Wheels	On a new principle	John Lamb,	October 3, 1842.
219	Do do	New description of	John Livingstone,	Dec. 14, 1846.
75	Do do	New method of constructing	Elias Nichols,	April 4, 1845.
133	Do do	A new machine called the Hydrapneumatic	W. P. Newman,	Sept. 12, 1848.
250	Do do	Do do	W. P. Newman,	Sept. 15, 1848.
168	Do do	The Vertical Percussion Re-action	George Rogers,	Dec 3, 1841.
61	Do do	New and Improved	Harvey Tripp,	Dec. 12, 1842.
167	Do do	Called the "Submerged Anfractuous"	Harvey Tripp,	Sept. 1, 1841.
280	Do Heater	Improved method of heating water and other liquids	Alfred Wilbur,	March 25, 1850.
176	Wheel Paddle	"Sweeping Paddle Wheel"	Nicol H. Baird,	January 12, 1842.
166	Do do	For propelling Steam or other Vessels	Richard D. Chatterton,	June 22, 1841.
56	Do do	Osculatory Propeller	Peter Fleming,	March 12, 1842.
174	Do do	Do	Peter Fleming,	March 7, 1842.
132	Do do	For steam, horse and other boats	Chas. Midgeley,	August 10, 1848.
423	Do do	Improved Self-adjusting Paddle Wheel	Wm. J. Spence,	July 26, 1853.
77	Do do	Method of constructing the Sweeping	Nicol H. Baird,	May 30, 1845.
375	Wheels for Carriages	Improved machine for making	Edward C. Ennis,	Sept. 30, 1852.
137	Do do	New mode of constructing	— LaGrange,	Novr. 6, 1848.
357	Do do	Improved in the manufacture for all kinds of Carriages	Peter Murdoch,	May 28, 1852.
1	Washing and Fulling	A new machine for	Noah Cushing,	June 8, 1824.
310	Washing Clothes	New composition to be used for	John Darling,	January 31, 1851.
185	Do Machine	New and improved	Peter R. Lamb.	October 3, 1842.
370	Do and Churning	New machine for	Richard Lossing,	August 31, 1852.
257	Do Machine	For Clothes, &c.	Martin Pierce,	Sept. 15, 1848.
7	Winnowing and Threshing.	A machine for	N. Cushing and R. Welton,	October 31, 1826.
257	Do Machine	Improvement in manufacture of	Elias J. Severance,	May 5, 1849.
345	Wagons	Improvements in the construction of	Nevens Jones,	January 19, 1853.
331	Weighing Machine	An improved	Calvin P. Ladd,	June 30, 1851.
37	Do Balance	New and improved	Otis Warren,	June 30, 1834.
51	Windlass Propeller	New and improved	Jas. McKenzie,	March 13, 1840.
139	Windlass	Improvement in the machinery of a Ship's Windlass	Jos. Henry, & P. McQuilkin.	January 20, 1849.
183	Wheel and Screw	Power derivable from and applicable to all kinds of machinery in Mills	Wm. McCall,	May 30, 1844.
328	Wheat Machine	For separating and cleaning	Roswell Merrill,	June 16, 1851.
82	Windows	Improved mode of making	François Nadeau,	Sept. 18, 1845.
258	Weights	Improved method of raising and lowering	Chas. M. Tate,	May 11, 1849.
263	Do	Do do	Chas. M. Tate,	Sept. 3, 1849.
90	Yoke, Oxen	Improved Yoke for Oxen	Horatio A. Rockwell,	March 24, 1846.
356	Do	New method of constructing	Horatio A. Rockwell,	May 8, 1852.
123	Shower Bath	Improved method of making	Michael Dwyer,	Nov. 10, 1847.
	Do	The Circumfluent	Wm. Hallowell,	July 16, 1842.
310	Soap	Improved composition for washing	John Darling,	January 31, 1851.
29	Do	A machine for Cutting	John Mathewson,	Decr. 27, 1831.
193	Saddle Riding	Improvement in construction	John Griffith,	July 14, 1845.
229	Shingle Machine	For cutting shingles, veneers, &c.	Jason C. Gillett,	May 1, 1847.
332	Do	For making shingles	Geo. Hawley,	July 4, 1851.
10	Do	For do	Phillip Schoolcraft,	May 15, 1830.

No.	Description of the Invention.	Name of Patentee.	Date of Letters Patent.
372	Straw Cutter ... ... Improvement in R. Tremaines' Patent of 24th September, 1849, No. 264.	Alfred Gifford, ...	Sept. 20, 1852.
388	Straw and Hay Cutter ... An improved	Peter R. Higley, ...	March 7, 1853.
341	Do ... ... Do	Do	Novr. 6, 1851.
322	Do ... ... Do	Daniel Mandigo, ...	May 2, 1851.
264	Straw Cutter ... ... An improved	R. Tremaine, ...	Sept. 24, 1849.
428	Do ... ... Do	Lewis Reese, ...	Sept. 19, 1853.
300	Straw and Hay ... ... Box for cutting	Ithamar P. Smith,... ...	Decr. 7, 1850.
69	Spike Machine ... ... New and Improved	John M. Holland, ...	March 6, 1844.
384	Do ... ... Useful method of constructing...	Geo. Stacey, ...	January 20, 1853.
83	Sawing Machine ... ... New and improved	Alexis Herbert, ...	Octr. 10, 1845.
366	Do do ... ... For cutting all kinds of wood, stone. &c....	Robert Might, ...	Aug. 10, 1852.
419	Do Planing ... ... Machine for Sawing and Planing by one operation	Alex. S. Walbridge, ...	July 20, 1853.
360	Seed Drill ... ... An improvement in the	Lawrence Hagar, ...	June 30, 1852.
395	Do do ... ... Improved to be attached to a Plough	Peter Murdoch, ...	April 15, 1853.
327	Staves ... ... A machine for cutting and sawing	Edwin Jenney, ...	June 16, 1851.
10	Do and Shingles ... Do do	Peter Schoolcraft.	May 15, 1830.
291	Do Dresser ... ... New method of making	Wm. R. Leaver, ...	April 2, 1850.
292	D Jointer ... ... Do do	Wm. R. Leaver, ...	April 2, 1850,
33	Stump Extractor ... ... New and improved	Wm. A. Leggo, ...	January 28, 1834.
223	Do ... ... A piece of mechanism designated the	John McLaren, ...	January 11, 1847.
241	Do ... ... Improvement to the	John McMichael, ...	May 26, 1848.
282	Do ... ... An improved machine called the	Robert St. Onge, ...	March 22, 1850.
53	Seine or Net ... ... For the Capture of Porpoises	Moïse Morin, ...	August 5, 1840.
139	Ship's Windlass ... ... Improvement in the machinery of	P. McQuilkin & Jos. Henry.	January 20. 1849.
193	Screw and Wheel ... ... Power derivable from and applicable to all kinds of machinery in Mills	Wm. McCall, ...	May 30, 1844.
54	Screw ... ... An improvement on Smith's Archimedian Screw	Nicholas Walker, ...	March 24, 1841.
299	Spark Killer ... ... New machine called spark killer and heat retainer	Chas. Midgeley, ...	August 13, 1849.
102	Do Arrester extinguishing. New mode of constructing	Amos. Tyler, ...	Sept. 26, 1846.
11	Spinning Machine ... ... New and improved	Phillip Schoolcraft, ...	June 26, 1830.
88	Stone Cutter ... ... A new and useful machine called the	Augustin Trepanier, ...	March 4, 1846.
308	Sick and Wounded ... An improvement in an old Patent Bedstead for the sick and wounded	Jos. Watson, ...	January 31, 1851.

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